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# Standard Review Plan for a Petition for Rulemaking on Radioactive Waste Streams Below Regulatory Concern

Expedited Review in Accordance  
with Appendix B to 10 CFR Part 2

Draft Report for Comment

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**U.S. Nuclear Regulatory Commission**

Office of Nuclear Material Safety and Safeguards

P. M. Larkins



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OCTOBER 1959

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STANDARD REVIEW PLAN FOR A DESIGN FOR CONTAINERS  
ON RADIOACTIVE WASTE STREAMS HELD IN REGULATORY CONTROL

October 1991

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P. M. Larkins

Division of Low-Level Waste Management and Decommissioning  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555



## ABSTRACT

This Standard Review Plan (SRP) provides guidance to staff acting on rulemaking petitions to exempt from regulation radioactive waste determined to be below regulatory concern (BRC). The review plan is designed to ensure the quality and uniformity of staff reviews and to present a well-defined base for the staff's evaluation of BRC rulemaking petitions. The plan serves to improve the understanding of the staff's review by interested members of the public and the industry. It also provides information about the BRC rulemaking process to a wider audience. The two-step review consists of (1) an initial acceptance review to determine whether a petition for rulemaking complies with the requirements to 10 CFR Part 2 "Rules of Practice for Domestic Licensing Proceedings," section 2.802(c) "Petition for Rulemaking," combined with a regulatory and technical screening review for compliance with Commission policy contained in Appendix B to 10 CFR Part 2, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Streams Below Regulatory Concern;" and (2) a subsequent detailed regulatory and technical review for compliance with the aforementioned Commission policy. The SRP is primarily based on and follows the format of the Commission policy statement. Each individual SRP addresses the responsibilities of the reviewer, the matters that are reviewed, the Commission's regulations and acceptance criteria necessary for the review, how the review is accomplished, and the implementation requirements.

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## I. INTRODUCTION

This Standard Review Plan (SRP) provides guidance to staff reviewers acting on rulemaking petitions to exempt from regulation certain radioactive waste determined to be "below regulatory concern" (BRC). The principal purpose of the review plan is to ensure the quality and uniformity of staff reviews and to present a well-defined base from which to evaluate rulemaking petitions for BRC. It is also a useful document to make information about regulatory matters widely available and to improve the understanding of the staff review process by interested members of the public and the nuclear industry.

Section 10 of the Low Level Radioactive Waste Policy Amendments Act of 1985 (the Act) directed the Commission to develop standards and procedures for expeditious handling of rulemaking petitions to exempt from regulation the disposal of slightly contaminated radioactive waste material that the Commission determined to be "below regulatory concern" (BRC). Section 10 of the Act addresses disposal of these "below regulatory concern" wastes which, because of their radioactive content, would not need to be subject to regulatory control to assure adequate protection of the public health and safety. The goal of this section of the Act is for the Commission to determine when particular waste streams need not go to licensed low-level radioactive waste (LLW) sites. Alternative disposal would conserve space in the existing sites while new sites are established, reduce problems associated with the physical properties of the BRC waste material, and reduce the costs of disposal. Rulemaking petitions may play a role in the national LLW strategy outlined by the Act.

On August 29, 1986, the Commission responded to this legislation by issuing a policy statement and staff implementation plan (51 FR 30839) providing guidance on how the requirements in 10 CFR 2.802 could be met in an expeditious manner. The policy statement outlined the approach and decision criteria to be used in implementing and evaluating petitions.

This standard review plan, which describes procedures that the NRC staff will use to act on petitions for BRC rulemaking, is primarily based on the Commission policy statement and staff implementation plan (Appendix A).

Each individual SRP provides the complete procedures and all acceptance criteria for all the areas of review pertinent to that SRP. However, for any given application, the staff reviewers may select and emphasize particular aspects of each SRP as is appropriate for the application.

Each individual SRP identifies who will perform the review, the matters to be reviewed, the basis for the review and how the review will be performed. The regulatory and technical review will be performed by an interoffice work group comprised of staff members from the Office of Nuclear Regulatory Research, the Office of Nuclear Material Safety and Safeguards, the Office of Nuclear Reactor Regulation, and the Office of Governmental and Public Affairs. Legal assistance will be provided by the Office of the General Counsel.

The SRP is one of the principal mechanisms that will allow the NRC staff to review a BRC rulemaking petition in an expedited manner.

Each SRP is organized into the following seven sections:

- RESPONSIBILITY FOR REVIEW

This section identifies the organization(s) responsible for evaluating the subject or functional area covered by the SRP. If more than one organization is to participate in the review, then the organizations are listed in descending order of responsibility.

- AREAS OF REVIEW

This section describes the information that will be reviewed by the branch with primary review responsibility. It contains a description of the proposed action, alternatives, analysis, decision rationale, legal constraints and implementation that will be reviewed as part of that particular section of the petition. It may also discuss briefly the information needed or the review expected from other NRC branches to permit the primary review branch to complete its review.

- REVIEW PROCEDURES

This section discusses how the review will be performed. It generally includes step-by-step procedures that the reviewer will follow to reasonably verify that the applicable criteria have been met. If not, the petitioner should be requested to submit supplementary information and/or re-submit the petition with adjustments to the schedule, as appropriate.

- ACCEPTANCE CRITERIA

This section contains a statement of the purpose of the review, applicable NRC requirements, and the technical bases for determining the acceptability of the proposal within the scope of review of the SRP. The technical bases consist of specific criteria such as NRC regulations and industry codes and standards.

- EVALUATION FINDINGS

This section contains a summary and conclusion of the general topics covered by the petition and the petitioner's and staff's assessment of the appropriateness of the exemption. It will also address the bases for any deviations from the SRP.

- IMPLEMENTATION

This section explains how the SRP and the acceptance criteria will be implemented by the staff. Except in those cases in which the applicant proposes an acceptable alternative method for complying with the Commission's regulations and policy, the method described in the SRP will be used by staff in its evaluation of conformance with Commission regulations and policy.

- REFERENCES

This section lists the references that will be used in the review process.

## I. INTRODUCTION

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The SRP is one of the principal mechanisms that will allow the NRC staff to review a BRC rulemaking petition in an expedited manner.

- REVISIONS OF THE STANDARD REVIEW PLAN

The SRP will be revised and updated periodically to clarify the content or correct errors and to incorporate modifications. A revision number and publication date are printed on the lower right-hand corner of each page of each SRP, since individual SRPs will be revised as needed. The contents and status sheet indicates the revision numbers of the current SRPs.

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NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 1.1  
II. INFORMATION TO SUPPORT PETITIONS  
A. GENERAL  
10 CFR PART 2 REQUIREMENTS

---

A. GENERAL

An overall analysis of the general approach, direction, impact, and scope of the petitioner's proposal to exclude the waste stream from regulation and management as LLW in accordance with established NRC BRC policy criteria is presented. This section addresses (1) 10 CFR Part 2 requirements for a BRC Petition for Rulemaking, (2) environmental impacts, (3) economic impact on small entities, (4) computer program, and (5) the geographical scope for which the proposed rule shall apply.

10 CFR PART 2 REQUIREMENTS

The Administrative Procedure Act (5 USC 553(e)) gives any interested person the right to petition for the issuance, amendment, or repeal of an agency regulation. The Nuclear Regulatory Commission (NRC) has codified its regulations that implement this basic procedural requirement at 10 CFR 2.802. The NRC will accept and process any petition for rulemaking that meets the basic sufficiency criteria presented in 10 CFR 2.802(e). The NRC has established additional procedures for the expeditious processing of a petition for rulemaking concerning the disposal of radioactive waste streams that may be below regulatory concern in Appendix B to 10 CFR Part 2. A petition for rulemaking concerning the disposal of radioactive waste streams that may be below regulatory concern is not eligible for fast-track processing under the criteria set out in Section 11.7 of the NRC Regulations Handbook (NUREG/BR-0053, Rev. 1). Section 10 of the Low-Level Radioactive Waste Policy Amendments Act of 1985 does not exempt the NRC from any procedural requirements applicable to a petition for rulemaking.

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## 1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.2 Secondary - Regulatory Publications Branch (RPB)  
Office of Administration (ADM)

Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

State Agreements (SA)  
Office of Governmental and Public Affairs (GPA)

Radiation Protection Branch (RPB)  
Office of Nuclear Reactor Regulation (NRR)

1.3 Support - Office of the General Counsel (OGC)

Office of the Secretary (SECY)

## 2. AREAS OF REVIEW

The Regulatory Publications Branch, ADM, in conjunction with OGC, determines whether a petition for rulemaking complies with the requirements of 10 CFR 2.802(c). When a "BRC" petition for rulemaking is received by the NRC, (ADM-RPB) will forward the petition to the Chairman of the interoffice work group.

The primary and secondary reviewers will review the petition to determine if it is eligible for expedited processing under Appendix B to 10 CFR Part 2, "General Statement of Policy and Procedures Concerning Petitions Pursuant to 2.802 for Disposal of Radioactive Waste Streams Below Regulatory Concern."

The following topics should be addressed in the petition to facilitate the staff's general overall review,

- (a) Statement of the problem,
- (b) Statement of grounds for and interest in action,
- (c) Reasonable alternatives to the proposed action,
- (d) Impacts of proposed action and alternatives, as appropriate, including costs and benefits,
- (e) Identification and description of each waste "stream", including an assessment of its' radiological content and chemical and physical form,
- (f) Demonstration of acceptability of each waste "stream" as a candidate for BRC consideration,
- (g) Practical or legal constraints,
- (h) Decision rationale and selection of proposed action,
- (i) Implementation of the proposed action.

The policy statement, Appendix B to 10 CFR Part 2, contains 14 decision criteria to be used in judging whether to grant a petition based on the overall impacts of the proposed action, the characteristics of the waste and its' properties, and implementation of the proposed exemption covered under Sections I through IV of the Staff Implementation Plan.

There are four major areas of review: (1) overall analysis and conclusions (general), (2) dose calculations, (3) waste information, and (4) implementation. These areas track the decision criteria as reflected in the following table (Table 1). Criteria 1 and 5 address the general overall benefits and impacts. Criteria 2-4 address expected individual and population doses and unexpected doses, and are the concern of the dose calculation review. Criteria 6-10 address the properties of the waste. Criteria 11-14 cover implementation aspects.

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1. COMPARATIVE CHART FOR DECISION CRITERIA AND SUPPORTING SECTIONS  
OF THE STAFF IMPLEMENTATION PLAN

---

14 Decision Criteria  
For BRC Petitions from  
Commission Policy Statement\*

Supporting Section  
of Staff Implementation Plan  
of Commission Policy Statement

---

General

- |  |                        |
|--|------------------------|
| 1. No significant environmental impact | A.2, A.4, B.1-4, D.1-3 |
| 5. Significant societal cost reduction | A.2-4, B.5, D.1-3      |

Doses

- |  |                         |
|--|-------------------------|
| 2. Expected individual doses - small   | A.2, A.4, B.1, B.3, D.1 |
| 3. Collective doses - small            | A.2, A.4, B.1, B.3, D.1 |
| 4. Insignificant accident consequences | A.2, A.4, B.1, B.3, D.1 |

Waste

- |  |                      |
|--|----------------------|
| 6. Compatible with proposed treatment/<br>disposal   | B.2, C., D.2         |
| 7. Usable on a national scale                        | A.5, B.4             |
| 8. Characterized waste and acceptable<br>variability | B.1, B.3-4, D.1, E.2 |
| 9. Real waste data                                   | B.2, B.4             |
| 10. Negligible potential for recycle                 | B.2                  |

Implementation

- |   |              |
|---|--------------|
| 11. Compliance Programs Feasible                        | E.1          |
| 12. No license needed for offsite<br>treatment/disposal | A.4, C., D.1 |
| 13. Standard treatment/disposal practices               | C., D.1      |
| 14. No regulatory obstacles                             | B.1-2, C.    |
- 

\*Appendix B to 10 CFR Part 2, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

Table 2 below presents the outline format for BRC petitions in column one and the applicable decision criteria/use in column two. It relates the requested information to its use. The table shows that in many cases the same information is used to make or help make several decisions. It also indicates that decisions on the assumptions and data in one area can have a ripple effect on others. Thus, while each reviewer may be responsible for looking at only one area, the reviewer should be mindful of the overall decision process and how the reviewer's portion fits into the decision.

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2. BELOW REGULATORY CONCERN PETITION OUTLINE FORMAT  
AND CORRESPONDING DECISION CRITERIA/USE

---

<u>II. Information To Support Petitions (Outline from</u>	<u>Corresponding</u>
<u>App. B to 10 CFR Part 2)</u>	<u>Decision Criteria/Use</u>
A. General	
1. 10 CFR Part 2 Requirements	Preliminary screening
2. Environmental Impacts	Criteria 1-5
3. Economic Impact on Small Entities	Criteria 5, Procedural Requirement
4. Computer Program	Criteria 1-5, 12 and D. Analyses
5. Scope	Criterion 7
B. Waste Characterization	
1. Radiological Properties	Criteria 1-4, 8, 14.
2. Other Considerations	Criteria 6, 9, 10, 14.
3. Totals	Criteria 1-4, 7, 8.
4. Basis	Criteria 7-9.
5. As Low As Reasonably Achievable (ALARA)	Criterion 5.
C. Waste Management Options	Criteria 6-14
D. Analyses	
1. Radiological Impacts	Criteria 1-5, 8, 12, 13.
2. Other Impacts	Criteria 1, 5.
3. Regulatory Analysis	Criteria 1, 5, Procedural Requirement
E. Recordkeeping and Reporting	
1. Surveys	Criterion 11.
2. Reports	Procedural Requirement (OMB), Criterion 8.
F. Proposed Rule	FR Notice

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The objective of the review is to determine whether the proposed exemption and supporting information demonstrate that there is reasonable assurance that the alternate disposal means will not pose an undue radiological risk to public health and safety. Section 51.41 of 10 CFR Part 51 notes that the Commission may require a petitioner for rulemaking to submit information to aid the Commission in meeting the requirements of NEPA, but that the "Commission will independently evaluate and be responsible for the reliability of any information which it uses." Evaluation may be no more extensive than having knowledgeable staff read and judge the acceptability of the material. The review of petitions being handled expeditiously is intended to be essentially confirmatory in nature. The Commission intends to use the computer program (IMPACTS-BRC) to independently evaluate petitioner's assessment of impacts (NUREG/CR-3585). Missing information or additional analyses beyond the capabilities of IMPACTS-BRC are to be provided by the petitioner (see SRP 1.4).

Review products should generally be documenting memoranda on the adequacy of the demonstration. Any problems with the actual text submitted by the petitioner that would preclude its use in preparing the required products for rulemaking should also be flagged (i.e., indicate any material that should not be incorporated into NRC rulemaking documents).

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The Office of the Secretary (SECY) logs in the petition for rulemaking and sends a copy of the document to the Regulatory Publications Branch (RPB), ADM. RPB, together with the Office of the General Counsel (OGC), determines whether or not the document meets the threshold requirements for a petition for rulemaking contained in 10 CFR 2.802(c).

Also see NUREG/BR-0053, Rev. 1, "Regulations Handbook," revised November 1987, for detailed guidance on the rulemaking process. If the petition for rulemaking meets the requirements of 10 CFR 2.802(c), RPB assigns a docket number and

returns a copy of the Petition for Rulemaking to SECY. SECY establishes docket control. If the requirements of 10 CFR 2.802(c) are not met, the petitioner is notified of the deficiency.

The Regulatory Publications Branch (RBP) performs the preliminary screening of the petition to determine if the submission is a "BRC" petition based on the petitioner's claim. The scope of the preliminary screening would include the usual determination that the petition meets the requirements of 10 CFR 2.802. RPB prepares a request for a draft Notice of Receipt for comment by the RES Chairman of the Interoffice Work Group which will subsequently be published in the FR. The "BRC" petition is then forwarded to the RES Chairman of the Work Group who will coordinate a more thorough preliminary "expedited handling" determination (acceptance review). NMSS will be the lead office responsible for the "screening review".

The acceptance review screening ("expedited handling"), performed by the Interoffice Work Group should be coordinated by the lead office (NMSS) to determine: (1) that the supporting information covers all the pertinent topics listed in this SRP, and/or Section II of the staff implementation plan in reasonable detail and (2) that each decision criteria is addressed and a conclusion presented stating that each is met. The purpose of the acceptance review screening is to determine whether or not the petition is suitable for expedited handling. The acceptance review screening should be as informal as possible to minimize delay in beginning the detailed review. The RES-Chairman of the Work Group should assure that collective efforts of staff asked to do the acceptance review cover all the information topics and decision criteria. Some staff review will be very specific (e.g., IMPACTS-BRC input data), and others more general according to the assigned emphasis and expertise. NMSS/LLRB will forward the results of the acceptance review screening for "expedited handling" to the RES Chairman, who will inform RPB of the results. RPB can notify the petitioner of the determination, in conjunction with the publication of the Notice of Receipt. The commitment for expedited handling should be made only for quality petitions with a high likelihood of approval.



### 3.2 Rulemaking Process Evaluation

Immediately upon ascertaining that the petitioner is claiming the petition is a BRC submission, RPB will forward a request to the RES Chairman of the Work Group for a decision on whether the petition should be processed routinely or expeditiously under the 10 CFR Part 2, Appendix B policy. Figure 1 outlines the 5 steps in the rulemaking process followed by figures 2-6, outlining the procedures involved in each step. If the decision is to follow expedited handling in accordance with Appendix B to 10 CFR Part 2, RPB would add the petition to the Regulatory Agenda which is updated quarterly. If the petition fails to provide reasonable supporting information or to reasonably demonstrate that the decision criteria are met, the petition will be processed routinely. By memorandum, the Interoffice Work Group indicates acceptance of the petition for expedited handling and points out to RPB the areas in which the petition is deficient for subsequent publication in the Federal Register with the Notice of Receipt of the Petition. (See Figure 2. Rulemaking Process Evaluation). If information is missing or other minor points need clarification, then informal discussions with the petitioner could prompt withdrawal, submission of supplemental information, or resubmission. (Telephone calls and meeting with the petitioner would help throughout the process but commitments and conversations must be documented and submitted to SECY and RPB for inclusion in the docket file).

As previously noted, agency procedures for processing petitions for rulemaking are contained in NUREG/BR-0053, "Regulations Handbook." Figure 1 outlines the schedule for the expedited rulemaking process and Figure 2 presents an overview of NRC's initial rulemaking process for handling BRC petitions. A proposed rule to exempt a specific waste stream could be in place within 6-12 months with final action on the petition completed within 12-24 months. These procedures coupled with agency policy to complete all rulemakings within 2 years will provide expeditious action on the petitions. Proposed rules will be forwarded to the Commission on a 6-month schedule to the extent permitted by resource limits, the nature and extent of public comments, and internal control of rulemaking procedures. Rulemakings involving power reactors must be reviewed by the Committee on Review of Generic Requirements (CRGR) prior to publication.

Proposed rules involving reactors will therefore be forwarded to the Commission on a 7-month schedule to the extent permitted by resources, comments, and approval procedures. In both cases, every effort will be made to publish proposed rules no later than 12 months after noticing for public comment. Such timing will require quick staff response and priority attention (see Figure 1. Schedule for Expedited Rulemaking Process). If multiple petitions are received, the nature, number, timing, and extent of public comment would influence how the schedule would be impacted.

Note: Agreement States will be involved early in the process of developing the proposed rule. This is particularly important when the NRC rule is being made "a matter of compatibility," i.e., where the Agreement States are required to adopt the same rule in State regulations. Therefore, copies of the appropriate portions of the petition would be sent to the States when the petition is being noticed, allowing 60 days for comment. Concurrently, a briefing should be scheduled with the Advisory Committee on Nuclear Waste (ACNW) within 60 days of the FR publication date in order to expedite the rulemaking process (see Figure 3, Review Process).

### 3.3 Expedited Rulemaking Process

RPB prepares a draft notice of receipt of a petition for rulemaking for publication in the Federal Register. This notice describes the contents of the petition and allows at least 60 days for public comment. RPB will forward this notice to the Interoffice Work Group for comment/concurrence and an expedited handling determination. After the Interoffice Work Group concurs and provides its findings, RPB will publish the notice in the Federal Register.

Once a decision is made to handle a petition expeditiously, a series of administrative tasks must be completed to prepare for the detailed technical review which will follow. In order to continue with the review, the Interoffice Work Group must first request and receive authorization from the EDO. This request is transmitted in the form of a memorandum from the coordinating lead office, the Regulation Development Branch, RES, through the Director of RES, to

the EDO. The coordinating lead office (RES) may proceed to establish review responsibilities for the detailed technical review of the petition and may proceed with the review process for 30 days without the official authorization of the EDO (See Figure 3, The Review Process). EDO authorization to review a petition must be in-place before an evaluation of public comments begins, irrespective of whether or not the petition is processed expeditiously. The lead office works closely with other involved offices in determining the expertise and level of effort needed to review the petition. Expectations relative to expertise and staff time needed may well vary with each petition. However, the expertise needed for such a review should be adequate to cover the 14 decision criteria outlined in the Policy Statement. As part of this exercise the coordinating lead office (RES) shall also establish a schedule and target date for the resolution of the petition. The schedule and target date are intended to cover from the date of receipt of the petition to the date on which the response indicating resolution of petition is transmitted to the EDO. The decision, to either grant the petition through rulemaking or to deny the petition, constitutes resolution of the petition.

Figure 7, provides an initial listing of expertise and level of effort and some organization and staff designations. The project manager in the lead office will have to quickly negotiate the remaining assignments and confirm that designated resources are available. Substitutes will have to be obtained if needed. Additional areas of expertise or review may be needed for the specific petition. These would probably be identifiable from the acceptance review screening and planning should have already begun.

### 3.4 Preparation of Proposed Rule Package

Guidance on preparing proposed rulemaking packages is provided in Part 3 of NRC's Regulations Handbook (NUREG/BR-0053). This document provides various sample products. For these proposed rules the minimum requirements are:

1. Commission paper for EDO signature from RES/RPHEB;
2. Proposed Federal Register Notice;

3. Environmental Assessment/Regulatory Analysis (may be included in the notice if concise enough):
4. Letter for appropriate Congressional committees; and
5. A public announcement.

If an information collection requirement is included as indicated in the staff implementation plan, an Office of Management and Budget (OMB) package must be prepared, coordinated through the RES OMB contact, and sent to IRM for forwarding to OMB. Submittal to OMB is required before publication of the proposed rule. OMB clearance is required before publication of the final rule. NRC Manual Chapter 0230 contains guidance on preparation of OMB clearance packages.

Federal Register notices have specific format requirements. Appendix B of this SRP includes excerpts from the previously cited 10 CFR Part 40 rulemaking notice showing the format. (Also see NUREG/BR-0053, NRC Regulations Handbook). The excerpts also show a pseudo regulatory analysis in the notice itself under heading "VII Impact of the Amendments." The approach of combining environmental and regulatory analyses is not recommended for BRC petitions. The petition should contain an environmental and regulatory analysis and these should be presented as two separate documents. The documents may be referenced and summarized in the notice.

The notice needs to include a statement regarding regulatory flexibility and may also include a regulatory flexibility analysis. Appendix C contains a sample regulatory flexibility analysis excerpted from the final 10 CFR Part 61 notice (47 FR 57446 dated 12/27/82). Additional guidance is provided in NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission."

The proposed rule notice should be coordinated with EPA, DOT, and the States when published. The expedited process wouldn't accommodate coordination any earlier unless requested by EDO.

### 3.5 Preparation of Final Rule Package

Guidance on preparing final rulemaking packages is provided in Part 5 of NUREG/BR-0053, Rev. 1, "Regulations Handbook." This document provides sample products.

## 4. ACCEPTANCE CRITERIA

### 4.1 Regulatory Requirements

The regulations applicable to BRC petitions for Rulemaking are 10 CFR 2.802, "Petition for Rulemaking," and 10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Streams Below Regulatory Concern," as it relates to specific waste streams.

### 4.2 Regulatory Guidance

There are no regulatory guides that apply to the review of general information for BRC petitions for rulemaking.

### 4.3 Regulatory Evaluation Criteria

The information supplied by the petitioner should support the action sought by setting forth the specific issues involved, the petitioner's views or arguments with respect to those issues, and relevant technical, scientific, or other data involved to support the technical bases of the proposal as required by 10 CFR 2.802 and 10 CFR Part 2, Appendix B. The petitioner should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of subsequent responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The staff's acceptance review screening should verify that sufficient information has been provided in the petition for BRC to satisfy the requirements and guidance of 10 CFR Part 2, Appendix B and this review plan, and that the petition should be handled on an expedited basis.

### 5.2 Sample Evaluation Findings

The staff has reviewed the general information provided by [name of petitioner] in support of a petition for rulemaking on radioactive waste below regulatory concern (BRC) according to 10 CFR Part 2, Appendix 3.

- (a) The petitioner has adequately justified and provided supporting information complete enough so that Commission action is primarily limited to independent evaluation and administrative processing. The 14 decision criteria contained in Appendix B to 10 CFR Part 2 for staff to evaluate whether to grant a petition, involving the overall impacts of the proposed action, wastes properties, and implementation of the proposed exemption, have been addressed. The staff concludes that the initial screening evaluation finds that the petition is suitable for expedited action.
- (b) The staff finds that the petitioner has not supplied the general information necessary to review the petition on an expedited basis. The petitioner has been requested to submit the required information. Further evaluation of the petition is postponed pending receipt of additional information or a revised petition.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial review screening and the overall technical review of a petition for rulemaking on

radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the Commission's regulations and policy, the methods described herein will be used by staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

Code of Federal Regulations, Title 10, "Energy," U.S. Government Printing Office, Washington, D.C., revised annually.

NRC, FEIS on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov. 1982.

NRC, DEIS on 10 CFR Part 61, "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sept. 1981.

Oztunali, O. I. and G. W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.

Oztunali, O. I., and G. W. Roles, De Minimis Waste Impacts Analysis Methodology, NUREG/CR-3585, Volume 1, Feb. 1984.

Forstrom, J. M., and D. J. Goode, De Minimis Waste Impacts Analysis Methodology, IMPACTS-BRC User's Guide and Methodology for Radioactive Waste Below Regulatory Concern, NRC, NUREG/CR-3585, Volume 2, Jul. 1986.

NRC, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Rev. 1, May 1984.

NRC, "Regulations Handbook," NUREG/BR-0053, Rev. 1, November 1987.

EXPEDITED RULEMAKING PROCESS		TIMELINE
STEP 1	INITIAL PROCESS ACCEPTANCE REVIEW  PUBLISH FR NOTICE FOLLOWING INITIAL SCREENING REVIEW AND ACCEPTANCE OF PETITION	
STEP 2	IN-DEPTH TECHNICAL REVIEW AND EVALUATION	
STEP 3	FR NOTICE DOCUMENTING NRC STAFF FINDINGS AND PUBLISHING PROPOSED RULE	
STEP 4	FR NOTICE ON FINAL ACTION PUBLISHED	

Figure 1. Schedule for Expedited Rulemaking Process



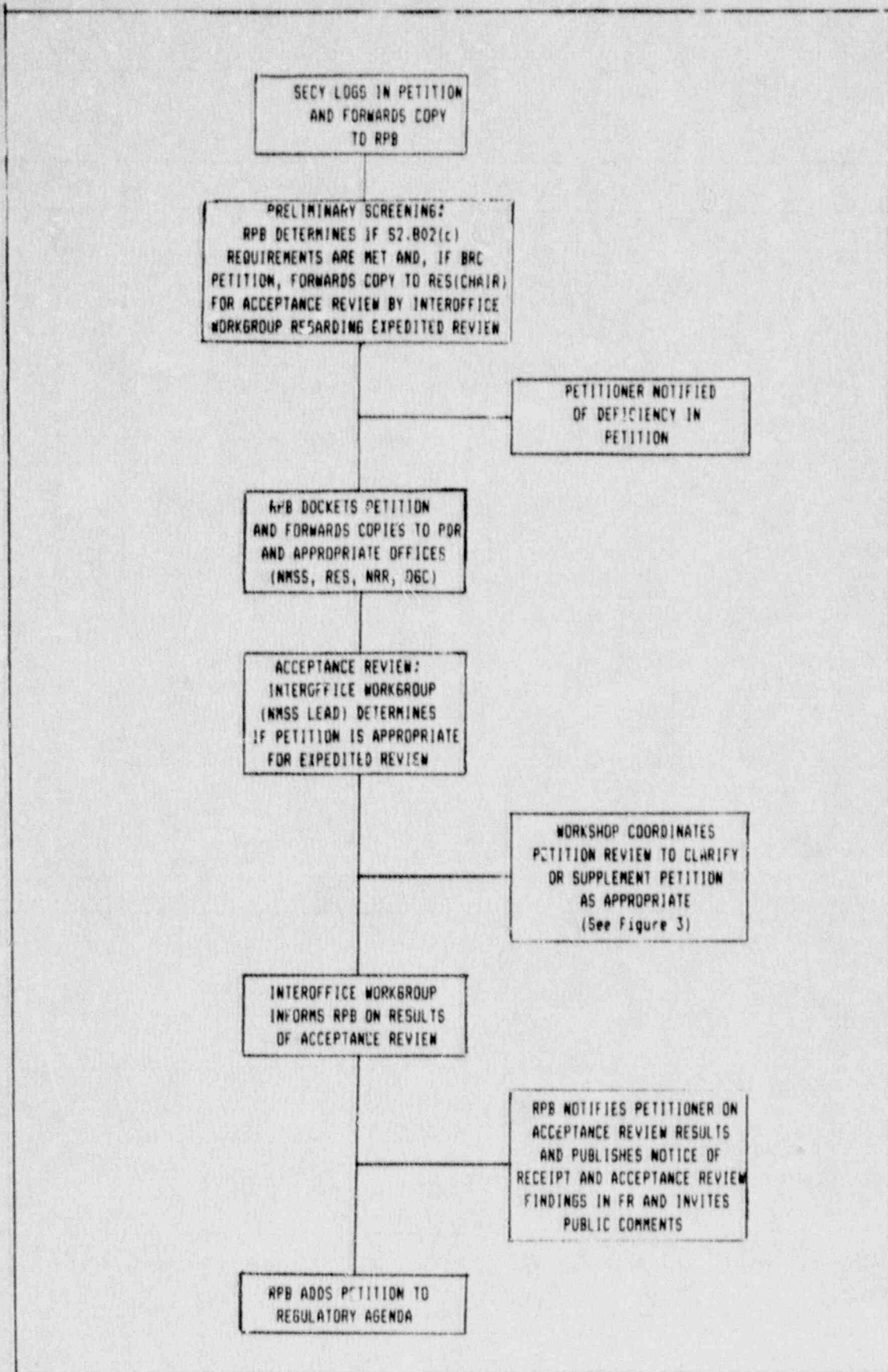


Figure 2. Initial Rulemaking Process Evaluation for BRC Petitions (Step 1)

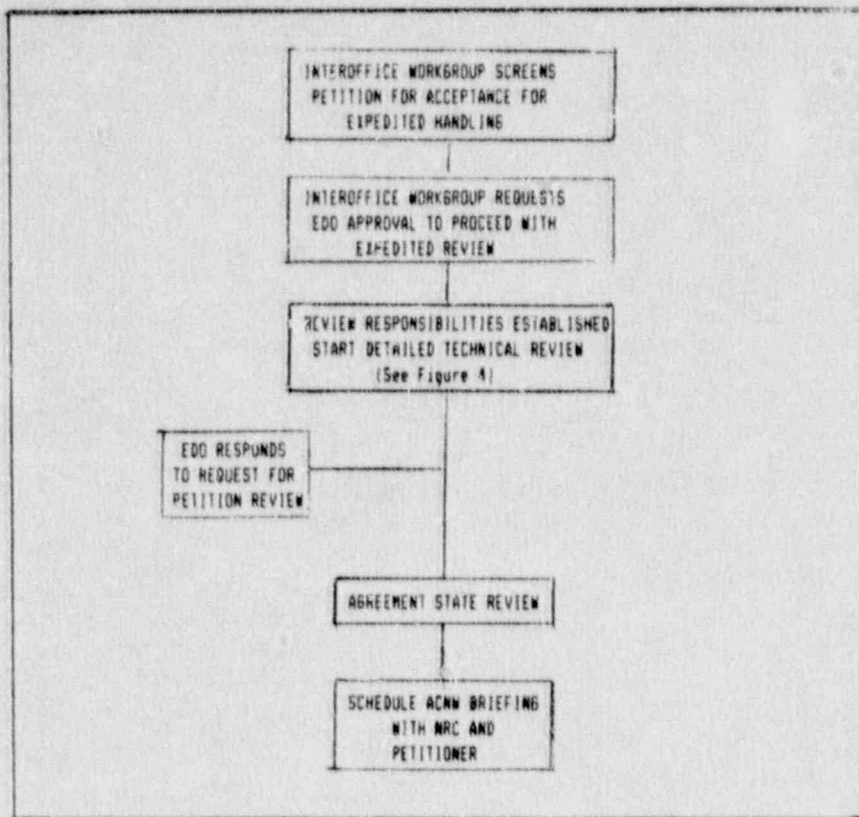


Figure 3. The Review Process (Step 2)

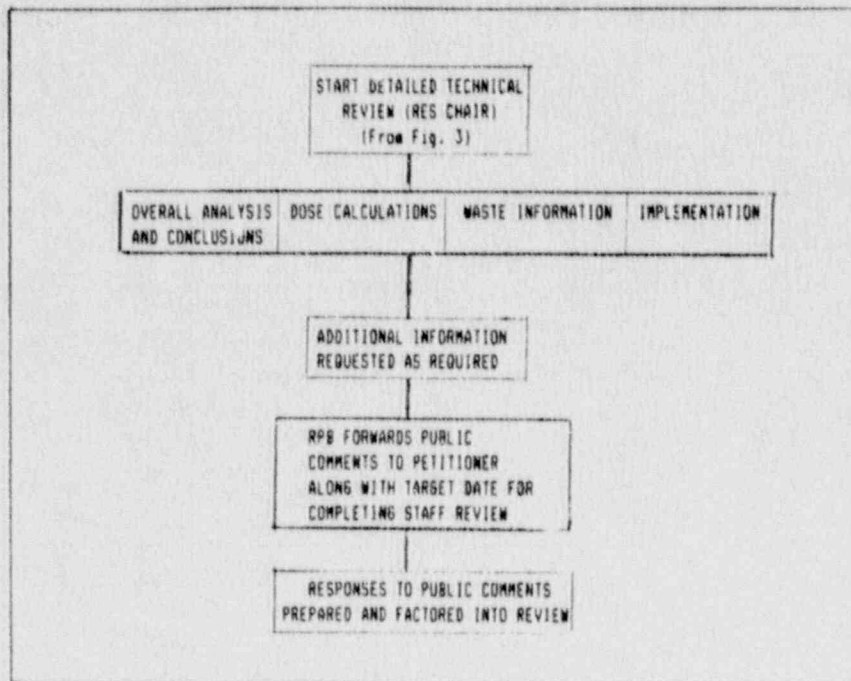


Figure 4. Technical Review (Step 3)

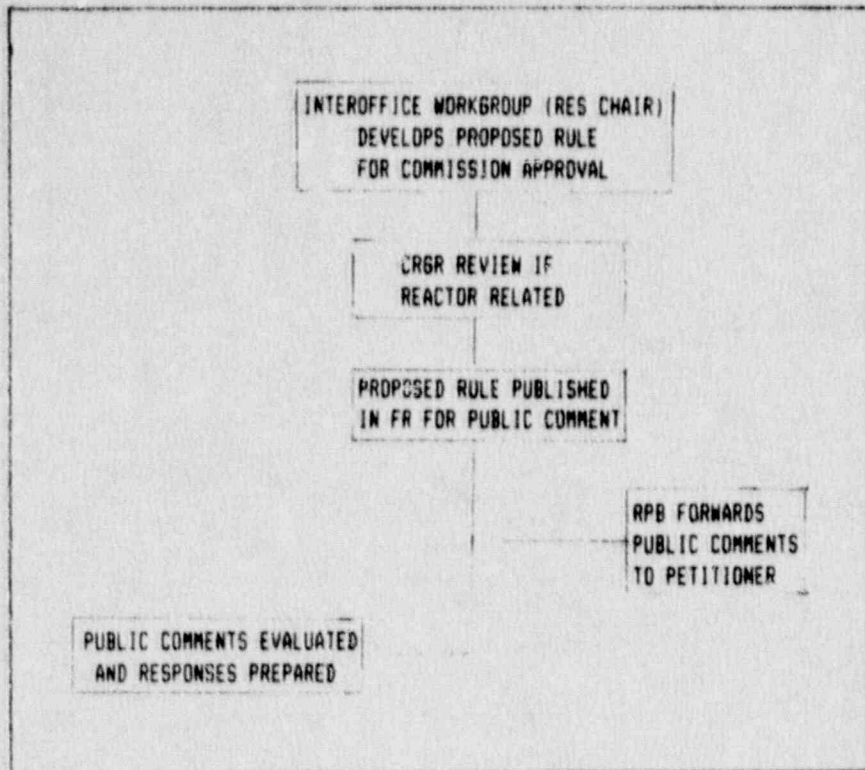


Figure 5. FR Notice on Proposed Rule Published (Step 4)

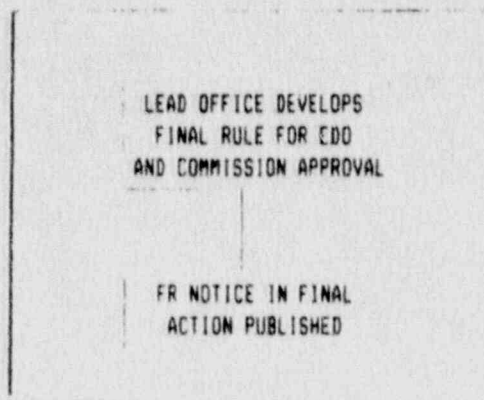


Figure 6. FR Notice on Final Action Published (Step 5)

## 7. STAFF RESOURCE NEEDS (LEVEL OF EFFORT)

Processing Steps	Expertise	Level of Effort (weeks)	Principal Reviewing Organization
1. Initial Processing		2-4	ADM/RPB
• Prelim. screening	Admin./Procedural		
• Acceptance Review	Admin./Procedural/ General technical		Interoffice work group
2. Establish Review Responsibilities	Rulemaking/Policy IMPACTS/BRC Waste Generation Environmental Assessment, Treatment/ Disposal	2-4	RES
3. Prepare FR Notice of Receipt of Petition	Admin./Procedural	3	ADM/RPB
4. Technical Review and Evaluation	See 2. Review Response	2-6 mos.	Interoffice work group
• Review public comments			
Decision Criteria			
• Review overall analysis and conclusions (1,5)			
• Review dose calculations (2,3,4)			
• Review waste information (6,7,8,9,10)			
• Review implementation (11,12,13,14)			
5. Prepare Proposed Rule Package	See 2. Review Response	1-3 mos.	RES
6. Prepare Final Rule Package		1-3 mos.	RES
• Response to comments			

NOTE: Budget estimates are 4 FTE per petition. (2.0 in WM and 2.0 outside WM)

Figure 7. Staff Resource Needs (Level of Effort)



NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 1.2  
A. GENERAL  
ENVIRONMENTAL IMPACTS

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ENVIRONMENTAL IMPACTS

This section of the petition shall comply with the requirements of Part 51 for an Environmental Assessment, Findings of No Significant Impact by the Commission and/or any other related Part 51 procedures.

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the environmental information supplied by the petitioner to evaluate whether or not a finding of no significant impact on the quality of the human environment can be made by the Commission.

The staff shall verify that the petition adequately addresses the following issues.

- (a) Need for proposed action,
- (b) Alternatives as required by section 102(2)(e) of NEPA,
- (c) Environmental impacts of the proposed action and alternatives as appropriate, including costs and benefits,
- (d) Practical or legal constraints,

- (e) Decision rationale and selection of the proposed action,
- (f) Implementation of the proposed action.

The "no action" alternative should always be included. A cost/benefit discussion is an essential part of both environmental and regulatory impact considerations. Therefore, the Commission considers it essential to expedited handling (see 10 CFR 51.22(b)). The cost/benefit discussion should include the differential exposure and economic costs between disposal at a licensed low-level waste disposal site and the proposed option(s). It may also include qualitative benefits. Reduced hazards from not storing hazardous or combustible materials might be a benefit. Elimination or reduction of the hazardous properties (e.g., by incineration) could be another. Costs might also be qualitative such as loss of space in municipal or hazardous sites. Costs of surveys and verifying compliance should also be covered. The cost/benefit should also reflect ALARA considerations. Radiation worker exposure, public exposure, and environmental releases might be appropriate in ALARA considerations. In considering the balance between exposure and the cost of exposure reduction to achieve ALARA, the petitioner could consider \$1000 per rem as a guideline.

The petition should not provide a means to dispose of wastes that would normally be sent to licensed sites. Means of volume reduction (e.g., segregation, alternative processes) should not be readily applicable. The staff shall independently evaluate the data and methodology used and the conclusions reached.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The staff shall review for compliance with Commission policy on BRC petitions for rulemaking contained in 10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," as it relates to specific waste streams.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

Acceptance criteria for this section of the petition are from Section II, of the Commission policy statement, 10 CFR Part 2, Appendix B.

Criterion 1. "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

The following criterion contribute to the overall finding of no significant impact.

Criterion 2. "The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events."

Criterion 3. "The collective doses to the critical population and general population are small."

Criterion 4. "The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant."

Criterion 5. "The exemption will result in a significant reduction in societal costs."

Criterion 10. "The disposed form of the waste has negligible potential for recycle."

#### 4.2 Regulatory Requirements

Applicable regulations are

- 10 CFR 51.30, "Environmental Assessment"
- 10 CFR 51.32, "Findings of No Significant Impact"
- 10 CFR 51.41, "Requirement to Submit Environmental Information"

#### 4.3 Regulatory Guides

None.

#### 4.4 Regulatory Evaluation Criteria

The information supplied by the applicant should provide evidence to support a finding of no significant impact on the quality of the human environment. The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the environmental impacts associated with the specific waste stream and the health and safety of the environment. The staff will summarize the bases and findings of the environmental impacts relative to the criteria listed above.

#### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the assessment of the environmental impacts supports the proposed exclusion of the waste stream from regulation and management as LLW, would not result in exceedence of the established policy criteria



contained in Appendix B to 10 CFR Part 2, and would result in no significant environmental impacts.

The staff finds that the assessment of the environmental impacts relative to the proposed exclusion of the waste stream from regulation and management as LLW may potentially result in impacts slightly exceeding those established in Part 51 and the policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the assessment of the environmental impacts does not support the proposed exclusion of the waste stream from regulation and management as LLW and may potentially result in impacts exceeding those established in Part 51 and the policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the Commission's regulations and policy, the method described herein will be used by staff in its evaluation of conformance with Commission regulations and policy.

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## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

---

STANDARD REVIEW PLAN 1.3  
A. GENERAL INFORMATION  
ECONOMIC IMPACT ON SMALL ENTITIES

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ECONOMIC IMPACT ON SMALL ENTITIES

This section of the petition shall comply with the Regulatory Flexibility Act when a rulemaking is likely to have a significant economic impact on a substantial number of small entities.

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the information supplied by the petitioner, which should include (1) an evaluation of the estimated economic impact on small entities, (2) cost estimates for small entities in staff time and dollars, (3) analysis of alternatives including costs and benefits and (4) an assessment of incremental recordkeeping and reporting costs, to either certify that the rule will not economically impact or will have no significant economic impacts on small entities, or present an analysis of alternatives to minimize the impacts.

The staff shall review for compliance with the Regulatory Flexibility Act when a rulemaking is likely to have a significant economic impact on a substantial

number of small entities. For further guidance see NUREG/BR-0058, Rev. 1, Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission, May 1984.

(The Commission's size standard for identifying a small entity is \$3.5 million or less in annual receipts except for private practice physicians and educational institutions where the standard is \$1 million or less in annual receipts for private practice physicians, and 500 employees for educational institutions. See 50 FR 50214, December 9, 1985.)

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Preview

The staff shall review to identify any missing data, information, or analyses necessary for the staff's evaluation.

The staff shall verify that the petition adequately addresses the following issues:

- (a) Evaluation of estimated economic impact on small entities,
- (b) Cost estimates for small entities in staff time and dollars,
- (c) For significant impacts; analysis of alternatives including costs and benefits, and
- (d) Assessment of incremental recordkeeping and reporting costs.

The staff shall independently evaluate the data and methodology used and the conclusions reached.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

Legislative.

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

Public Law 96-534, "The Regulatory Flexibility Act."

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of subsequent responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The staff findings will summarize the petitioner's and staff's assessment of the economic impact, and costs and benefits (including proposed alternatives), and incremental recordkeeping and reporting costs of the proposed action on numerous small entities. The staff will summarize the bases of the findings relative to the decision criteria. The findings should include one of the following statements.

## 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the assessment of the economic impact on small entities would not result in exceedence of established regulations and would result in negligible health and safety impacts.

The staff finds that the assessment of the economic impact on small entities may potentially result in impacts slightly exceeding established regulations and criteria. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the assessment of the economic impact on small entities may potentially result in impacts exceeding established regulations and criteria. The staff recommends that on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations and policy, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

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## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. NRC, Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission, NUREG/BR-0058, Rev. 1, May 1984.



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U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 1.4  
A. GENERAL INFORMATION  
COMPUTER PROGRAM

---

COMPUTER PROGRAM (Calculational Methods)

This section of the petition presents an assessment of the potential radiological dose impacts associated with the requested action. The Commission intends to use the computer program (IMPACTS-BRC) to independently evaluate, through a calculational analysis, petitioners data on radiological dose impacts.

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)  
  
Radiation Protection Branch (PRP3)  
Office of Nuclear Reactor Regulation (NRR)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the analysis of dose impacts supplied by the petitioner, with emphasis placed on (1) the effective whole body dose equivalent to the maximum individual (2) critical groups (3) collective populations (4) critical nuclides and (5) critical pathways. Exposure scenarios reviewed should include both internal and external transportation activities, air and water transport to offsite receptors, and intrusion into disposed waste. Assumptions, calculational techniques, facility and environmental parameter values, and results should be described in sufficient detail to allow a thorough independent evaluation of the assessment. The analysis of dose impacts should clearly address:



- The maximum individual exposures.
- The critical population exposures.
- The cumulative population exposures.

The Methodology described in NUREG/CR-3585, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide, Volume 1, (version 2 expected October 1989) can be used by the petitioner to quantitatively demonstrate compliance to applicable BRC standards. IMPACTS-BRC code models calculate impacts for a wide range of treatment and disposal options which include on-site treatment and disposal by the generator, shipment to a municipal or hazardous waste treatment and disposal facility, and post-disposal activities. Post-disposal impacts result from releases due to intrusion, groundwater migration, erosion, and leachate accumulation and treatment. If the petitioner was aware of other impacts which should have been considered for the specific wastes in the petition, the petitioner should have addressed the additional impacts. The petition should clearly relate the analytical findings to the specific provisions in the recommended rule changes. For example, the basis for each recommended radionuclide limit should be clearly explained. The analysis of impacts may show that limiting concentrations of individual radionuclides will assure that exposures to individuals, groups, and the general population will be small. However, for certain radionuclides and exposure pathways, site inventories or volumes may need to be limited to keep potential exposures small (e.g., the analysis may show that more than 100 millicuries of a radionuclide in a single landfill could result in potential individual exposures from the ground-water pathway of more than one millirem per year).

The analysis should also address potential exposures from handling and transport accidents, and from intrusion or loss of institutional control, at municipal or hazardous sites. Transportation accidents were not expressly included in NUREG/CR-3585 except for an occasional release from a dropped container. Applicable guidance, models, etc. (DOT, NRC, public domain may be used for accident analysis). The petitioner's analysis of accidents should include all assumptions, data, and results to facilitate staff's review.

The petition should clearly describe the environmental and facility characteristics for the proposed treatment and disposal of the BRC waste stream. Average and upper and lower (boundary limits) for the characteristics should be addressed. The spatial distribution of and sizes of facilities should be characterized on the national or regional scale. The status of receiving facilities with respect to other Federal, State and local laws, regulations, and permits should be described to facilitate the staffs review.

Staff shall review for inclusion of the following data:

- All specific input values needed to analyze waste using IMPACTS-BRC and basis for the specific input values.
- Written and/or computer printouts, and PC floppy diskettes, containing data files used to run IMPACTS-BRC on the proposed BRC waste stream
- Output of IMPACTS-BRC
- Written and/or computer printouts, and PC floppy diskettes, containing data files and FORTRAN source code for alternative calculational techniques
- Output of alternative calculational techniques
- Detailed discussion of differences between petitioner's analyses and those described in NUREG/CR-3585
- All information on additional impacts to allow independent evaluation of assumptions, calculations, and results
- Summary of radiation dose equivalents to the maximally exposed individual.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The petition shall be reviewed by staff to identify the correct use of the code, selection of treatment and disposal option, selection of parameter values, and any missing data, information, or analyses necessary for the staff's evaluation. Petitioner responses to the requested information will be evaluated using the methods outlined below and staff positions will be developed based on

the results of the analysis. Resolution, if possible, of potential radiological impact problems or of differences between petitioner's and staff's assessment bases, will be coordinated through the lead office, and the EA will be written accordingly.

The staff may, as appropriate, review the analyses by (1) running the IMPACTS-BRC program with waste stream input supplied by petitioner using default environmental and facility data; (2) running the IMPACTS-BRC program with waste stream and non-default environmental and facility data supplied by petitioner; (3) evaluating alternative calculational techniques; (4) performing limited verification of alternative calculations; (5) evaluating additional impact analyses and performing limited verification of same; (6) comparison of calculated doses with BRC criteria. A more detailed description of what these steps may entail follows.

Step 1. Default application of IMPACTS-BRC

The IMPACTS-BRC code is implemented using the default environmental and facility data. This application will use only the waste stream and options data supplied by the petitioner. The weighted whole body equivalent doses (ICRP 1978) for each pathway will be compared to the BRC criteria. Documentation of the application will include total calculated doses, critical pathway(s), and critical nuclide(s). In the event that Step 1 is used, Version 1 of IMPACTS-BRC would apply.

Step 2. Application of IMPACTS-BRC with non-default environmental and facility data

The IMPACTS-BRC code is implemented using the non-default environmental and facility data submitted by the petitioner. The staff will review the logic of the non-default parameters and may decide either to support or modify these values.

If the default data are not used, the staff may determine the changes in parameter values and whether these changes are reasonable based on supporting information submitted by the petitioner. The regional site parameters, for the

critical worker group and general population calculations, should represent realistic average characteristics of the proposed facility type. However, the site parameters used for the dose calculations for the maximally exposed individual should represent a conservative scenario which is extremely unlikely to be duplicated at an actual site. The petitioner must provide compelling justification for changes in the data for the maximally exposed individual scenario.

### Step 3. Evaluation of alternative calculational techniques

The petitioner may develop and apply calculational techniques other than those in IMPACTS-BRC. The staff will also evaluate any modifications to the IMPACTS-BRC code as well as the use of other codes and techniques. However, all calculations, assumptions, and application details supporting an alternative calculational technique must be presented in sufficient detail to allow an independent evaluation.

If IMPACTS-BRC is modified, the petitioner must supply all code modifications and an executable version of the modified code.

In addition, the staff shall review the detailed discussion of the differences between the proposed technique and that utilized by IMPACTS-BRC. This discussion will be provided by the petitioner. The staff will independently evaluate the changes in calculated impacts caused by the various different techniques. This process will highlight the changes which are most crucial to the adequacy of the impact assessments.

### Step 4. Limited verification of alternative calculations

If a particular modification to the IMPACTS-BRC code is deemed appropriate based on the justification provided in the petition, NRC will adopt the modification and will verify the petitioner's results by implementing the IMPACTS-BRC code. Likewise, limited verification calculations will be performed by the staff using alternative codes or calculational techniques supplied by the petitioner.

#### Step 5. Evaluation and verification of additional impact analyses

Impacts due to accidents are not assessed by the current IMPACTS-BRC and must be calculated separately. Therefore, petitioners may use applicable models, guidance, etc., (including any DOT guidance regarding transportation accidents) for accident impact calculations.

The analysis of potential dose impacts from transportation should be based on a reasonable spatial distribution of licensees and waste treatment and disposal facilities which will accept the wastes. The petitioner should have addressed parameters such as average and extreme transport distances. The petitioner's analysis should address the basis for parameter selection and characterize the expected patterns (e.g., indicate the probability of the extreme case).

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 1: "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

The following criterion contribute to the overall finding of no significant impact.

Criterion 2: "The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events."

Criterion 3: "The collective doses to the critical population and general population are small."

Criterion 4: "The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal site after loss of normal institutional controls are not significant."

Criterion 5: "The exemption will result in a significant reduction in societal costs."

Criterion 12: "The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes."

#### 4.2 Regulatory Requirement

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

NRC, Manual Chapter 0904-4, NRC Computer Software Policy.

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of potential impacts, critical pathways identified, critical nuclides identified, and modifications or alternatives to the IMPACTS-BRC methodology resulting in significantly reduced impact estimates. The staff will summarize the bases and findings on the radiological impacts relative to the criterion listed above. The criterion which is limiting in terms of allowable concentrations and total mass of nuclides will be highlighted. Considerations which would lead to changes in the safety of BRC treatment and disposal should be described.

### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the proposed inputs to the codes are sufficient to assess the potential radiological dose impacts.

The staff finds that the proposed inputs to the codes are not sufficient to facilitate an assessment of the radiological dose impacts. Further evaluation of the computer code data is postponed pending receipt of additional information.

The staff finds that the proposed inputs to the codes do not meet established NRC BRC policy criteria. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.





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Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 1.5

A. GENERAL INFORMATION

SCOPE

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SCOPE

This section of the petition describes the overall geographic area for which the proposed rule shall apply.

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the information supplied by the petitioner describing the geographic scope for which the rule shall apply and the reasons supporting any area less than national in scope. It might be possible to justify limiting the scope to a low-level waste regional compact or a state, but implementation issues such as import or export of wastes outside the compact or state should be addressed in the rationale.

3. REVIEW PROCEDURES

3.1 Acceptance Review

This section of the petition is reviewed to identify any missing data, information, or analyses necessary for the staff's evaluation.

Staff should review for inclusion of the following information:

- (a) Justification for limitation of scope,
- (b) Import and export waste process outside the compact or state, if scope less than national,
- (c) Legal contracts or agreements,
- (d) Practical or legal constraints.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 7. "The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category."

##### 4.2 Regulatory Requirement

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

10 CFR 2.800, "Scope of Rulemaking."

10 CFR Part 61, "Licensing Requirements for Lead Disposal of Radioactive Waste."

##### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of subsequent responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the overall scope for which the rule shall apply. The staff will summarize the bases and findings relative to the decision criteria above.

#### 5.2 Sample Evaluation Findings

The staff finds that the overall scope would not result in exceedance of the established policy criteria contained in Appendix B to 10 CFR Part 2 and would result in negligible health and safety impacts.

The staff finds that the overall scope [slightly exceeds] or [may exceed] the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff disagrees with the petitioner's justification for limitation of the overall scope for which the rule shall apply to less than national.

The staff would present or recommend several options, (1) inform petitioner of staff findings and ask for more information to reassess, or (2) based on staff findings, recommend that petition be denied and the waste stream be relegated and managed as LLW.

### 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radio-

active waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations and policy, the method described herein will be used by staff in its evaluation of conformance with Commission regulations and policy.

#### REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

Oztunali, O. I., and G. W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.

NRC, FEIS on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, 1982

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**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 2.1

B. WASTE CHARACTERIZATION

RADIOLOGICAL PROPERTIES

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B. WASTE CHARACTERIZATION

This section of the petition characterizes the waste stream proposed as being below regulatory concern. NOTE: The term "stream" only means wastes produced from a common set of circumstances and possessing common characteristics. It does not mean "liquid" although the stream may be in a liquid form (e.g., waste oil). The wastes may be resin beads, laboratory glassware, or any other form. A variety of waste streams would require separate evaluations for each type of waste, as well as, separate assessments of disposal methods.

RADIOLOGICAL PROPERTIES

This section of the petition describes the radiological properties of the waste materials.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

## 2. AREAS OF REVIEW

The staff shall review the description of the radiological properties of the waste stream supplied by the petitioner which should include at a minimum (1) the concentration or contamination levels and the half-lives, total quantity, and identities of the radionuclides present, (2) the chemical and physical form of the radionuclides should be addressed including uniformity of distribution (homogeneity), and (3) all radionuclides present and potential should be specified (including radionuclides identified as trace constituents). The petitioner should have provided a detailed description of the waste materials, including their origin, chemical composition, physical state, volume, and mass. Characterization of the distribution of the radionuclides within the wastes should be documented, e.g., surface or volume distribution, any particulates.

For incineration, the radioactive content of the ash and noncombustible fraction should be described. The petitioner should have estimated the number of NRC and Agreement State licensees that produce the waste, the annual volumes and mass, the distribution of generators, and the total annual quantities of each radionuclide that would be disposed of. The estimates should include the current situation and the likely variability over the next several years. If the petition is for a proposed rule that will be limited to less than national scope (a significant portion of a category -- at least a State or compact region), the totals should have been estimated for the petitioned scope. This may or may not preclude expedited handling depending on the completeness of the supporting data.

## 3. REVIEW PROCEDURES

### 3.1 Acceptance Review

The radiological properties are reviewed by staff to identify any missing data, information, or analyses necessary for the staff's evaluation.

The staff shall assess the petitioner's description of the radiological properties of the waste stream and verify inclusion, at a minimum, of the following information.

- (1) The concentration or contamination levels and the half-lives, total quantity, and identities of the radionuclides present,
- (2) The chemical and physical form and volume and mass of all the radionuclides,
- (3) All radionuclides present and potential should be specified, including trace constituents,
- (4) Verification of the uniformity of distribution of the radionuclides within the wastes, e.g., surface or volume distribution, and any particulates,
- (5) For incineration, the radioactive content of the ash and noncombustible fraction should be described,
- (6) For national scope, number of NRC and Agreement State licensees producing waste, annual volumes and mass, distribution of generators, and total annual quantities of each radionuclide that will be disposed of,
- (7) Current and projected situation,
- (8) For less than national scope (e.g., a State or compact region), the totals should have been estimated for the petitioned scope.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertains to this SRP.

Criterion 1. "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

Criterion 2. "The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events."

Criterion 3. "The collective doses to the critical population and general population are small."

Criterion 4. "The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant."

Criterion 8. "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses."

Criterion 14. "There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the radiological properties identified, the concentration levels and half-lives, total quantities, chemical and physical form including uniformity of distribution (homogeneity), all potential and present (including trace constituents) radionuclides, of the waste stream. The staff will summarize the bases and findings of the radiological properties relative to the criteria listed above. Considerations on total quantity and concentration levels or expected changes (including any particulates) in the waste stream characterization should be described.

### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the radiological properties of the waste stream are characterized in sufficient detail to assure that uncertainties in radiological impacts can be calibrated within reasonable bounds and do not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the radiological properties of the waste stream may potentially result in health and safety impacts exceeding the established NRC BRC policy criteria contained in Appendix B to 10 CFR Part 2, therefore precluding exclusion from regulation and management as LLW. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulation, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



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STANDARD REVIEW PLAN 2.2

B. WASTE CHARACTERIZATION

OTHER CONSIDERATIONS

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OTHER CONSIDERATIONS

This section of the petition presents the nonradiological properties, potential for recycle, and other considerations related to the waste stream.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review and consider information supplied by the petitioner describing the nonradiological properties, waste form, and the potential for recycle of the waste stream.

The nonradiological properties of the waste stream should be reviewed to assure that they are consistent with the proposed disposal method and to evaluate the adequacy of the analysis of the radiological impacts. (NRC's deregulation of the radioactive content would not relieve licensees from the applicable rules of other agencies which cover the nonradiological properties.) The staff will review the detailed description of the waste materials, including their origin,

chemical composition, physical state, volume, mass, hazardous constituent content, ignitability, corrosivity, and whether it is acidic or basic.

The term waste form includes packages or containers used to manage (i.e., store, handle, ship, or dispose) the wastes. Staff shall review petitioner's description of the variability and potential changes in the waste form as a function of process variation. The variation among licensees should have been described and bounded.

Compatibility with requirements associated with the proposed waste treatment/disposal options should be carefully reviewed. For example, if the petitioner proposes that the wastes be incinerated, the waste form should be shown to be compatible with the temperatures, flow rates, feed rates, and other operating parameters of typical incinerators that may be used. The petitioner should have identified the minimum requirements an incinerator must meet to assure adequate combustion. The petition should include a description of the form and volume of the ash and other residue from incineration for staff review. Similar considerations for disposal at sanitary landfills or hazardous waste sites should be included. For example, wastes that include components or properties that would qualify the waste as a "hazardous waste" under EPA rules in 40 CFR Parts 260 through 265 should not be proposed for disposal at a municipal landfill.

Staff will review petitioner's assessment of the potential for recycle which should include possible treatment, such as shredding, that would reduce the recycle potential. Both the resource value (e.g., salvageable metals) and the functional usefulness (e.g., usable tools) should be reviewed. Both short- and long-term potentials for recycle are of significant concern to the Commission. The short- and long-term potential for recycle should be reviewed by determining the metal content of the waste, whether the waste is shipped in metal drums, and whether the waste contains any non-metal materials such as glass which may potentially be recycled. The waste should not qualify as a nonradiological hazardous material if unrestricted disposal options are to be used. If the waste does qualify as nonradiological hazardous material, the proposed disposal method (incineration or disposal at a hazardous waste facility) should be in accord with EPA, State, and local regulations.



### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

This section of the petition is reviewed to identify any missing data, information or analyses necessary for the staff's evaluation. At a minimum the petition should include information on:

- (1) Detailed description of the waste material, including origin, chemical composition, physical state, volume and mass.
- (2) Non-radiological properties of the waste stream, including the hazardous constituent content, ignitability, corrosivity, and whether it is acidic or basic.
- (3) Description of waste form including variability and potential for change.
- (4) Discussion of short- and long-term potential for recycle.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertains to this SRP.

Criterion 6. "The waste is compatible with the proposed treatment and disposal options."

Criterion 9. "The waste characterization is based on data on real waste."

Criterion 10. "The disposed of form of the waste has negligible potential for recycle."

Criterion 14. "There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR 2.802, "Petition for Rulemaking."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

40 CFR, Environmental Protection Agency (Part 261).

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the non-radiological properties of the waste stream including origin, chemical composition, physical state, volume, mass, and hazardous constituent content, as well as petitioner's description of the waste form and potential for recycle.

The staff will summarize the bases and findings of the non-radiological properties relative to the criteria listed above. Consideration on the variability and potential changes in the waste form as a function of process variation and proposed waste treatment/disposal options for waste disposal should be described.

## 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the nonradiological properties of the waste stream would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2 and, therefore, would result in negligible health and safety impacts.

The staff finds that the nonradiological properties of the waste stream may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the nonradiological properties of the waste stream may potentially result in health and safety impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2, therefore, precluding exclusion from regulation and management as LLW. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



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STANDARD REVIEW PLAN 2.3

B. WASTE CHARACTERIZATION

TOTALS

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TOTALS

This section of the petition presents estimated totals of waste generation for the petitioned scope based upon the premise that an accepted rulemaking petition is generic and, therefore, the exemption would likely be used nationwide.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the petitioner's estimates of the (1) number of NRC and Agreement State licensees producing waste, (2) annual volume and mass, and (3) total annual quantities of each radionuclide that would be disposed of. The estimates should include the current situation and the likely variability over the reasonably foreseeable future. If the petition is for a proposed rule that will be limited to less than national scope (e.g., a state or compact region), the totals should be estimated for the petitioned scope. A concentration distribution would be a helpful tool in characterizing the waste stream. For example, the petitioner could indicate that 10 percent of the wastes fall

in the range of 1-10 picocuries per gram, 60 percent fall in the 10-100 range, and 30 percent in the 100-1,000 range. Such distribution would permit more realistic assessment of impacts in addition to conservative bounding estimates using maximum values. In any case, the typical quantities produced per generator and an estimate of the geographic distribution of the generators should be described.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

This section of the petition is reviewed to identify any missing data, information, or analyses necessary for the staff's evaluation.

At a minimum the following information should be provided:

- (a) Characterization and type of waste,
- (b) Number and type of generators,
- (c) Annual volumes and mass, and total annual quantities of each radionuclide for disposal,
- (d) Range distribution of waste,
- (e) Quantities produced per generator,
- (f) Estimate of geographic distribution of waste produced,
- (g) Estimated totals for proposed waste disposal covered under the scope of the proposed rule.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 1: "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

Criterion 2: "The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events."

Criterion 3: "The collective doses to the critical population and general population are small."

Criterion 4: "The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal site after loss of normal institutional controls are not significant."

Criterion 7: "The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category."

Criterion 8: "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of estimated totals of waste generation for the petitioned scope, i.e., the number of NRC and Agreement State licensees producing waste, the annual volume and mass, and the total annual quantities of each radionuclide that would be disposed of relative to the criteria listed above. The staff will summarize the basis and findings of the projected variability and the range of variation on a national scale or, for less than national, for the petitioned scope. Typical quantities produced per generator, the estimated geographic distribution and the impact on health and safety should be described.

#### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the estimated total annual quantities of radionuclides for disposal would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, indicating negligible health and safety impacts.

The staff finds that the estimated total annual quantities of radionuclides for disposal may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed



monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the estimated total annual quantities of radionuclides for disposal may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.

3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



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STANDARD REVIEW PLAN 2.4

B. WASTE CHARACTERIZATION

BASIS

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BASIS

This section of the petition shall present the basis for the waste stream characterization.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the information supplied by the petitioner describing the waste stream characterization. The basis for characterization of the wastes and the total quantities produced should be described including quality assurance aspects.

If the petitioner conducted any surveys of licensees or relied on surveys by others to help quantify the amount and content of wastes, they should be described. Market information might be useful in characterizing waste generation on a national basis. Designation as a "trace concentration" should be related to specified detection limits, but detection limits themselves are

not sufficient reason to dismiss trace concentrations when methods exist to infer concentration.

For estimates of the radionuclide content of the waste stream, the petitioner may take advantage of licensee experience in classifying wastes for disposal at low-level waste sites. For example, the transuranic radionuclide content of the wastes would likely be below detection limits, but licensees have already established scaling factors for estimating the transuranic content of wastes as part of complying with 10 CFR Part 61 waste classification requirements. Waste generators use generic scaling factors and factors established for their specific wastes through sophisticated analyses. The scaling factors are used to infer the presence and concentrations of many radionuclides based on measurement of only a few nuclides. The classification scheme in 10 CFR Part 61 has been in effect since December 1983.

Considerable data and experience should be available to allow characterizing the radiological content and composition of the waste stream being addressed in the petition. The same principles outlined in 10 CFR 61.55(a)(8) may be applied, i.e., values based on direct measurements, indirect methods related to measurements, or material accountability.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

This section of the petition is reviewed to identify any missing data, information, or analyses necessary for the staff's evaluation.

Rulemaking is not warranted for wastes involving a single licensee, whether a continuing disposal activity or a one time disposal. Such proposals by individual licensees should continue to be processed under 10 CFR 20.302(a). The policy statement and accompanying implementation plan addresses rulemaking petitions for streams from multiple users based upon the premise that the waste stream

is generic and, therefore, the exemption will most likely be used nationwide. However, if a petition is submitted for less than national scope, (a significant portion of a category -- at least a state or region) the corresponding waste characterization may or may not preclude expedited handling depending on the completeness (depth) of the supporting data.

To verify the usefulness of the petition and the normal generation of the proposed BRC waste stream, the staff will contact approximately 5 percent (up to about 10) of the generators surveyed by the petitioner and spot check information obtained in the information survey. In particular, the staff will determine if the generators are likely to use the exemption if available, and if it is feasible to significantly reduce waste volume without process modification.

The concentration or contamination levels, half-lives, and identities of the radionuclides in the waste stream should be compared to available information from references and waste management databases. All radionuclides present or potentially present should be specified, including nuclides identified as trace constituents. The distribution of the radionuclides within the wastes should be compared to reference waste stream characterizations.

Monitoring, analytical data, and calculations should be reviewed. If the petitioner conducted any surveys or relied on surveys by others, they should be reviewed. Survey results will be reviewed by performing a limited informal survey of 5 percent of the survey population (up to about 10 generators). Uncertainty in survey and other measurements should be reviewed to determine if the results can be relied upon as realistic and representative. For example, the representativeness of the samples and the appropriateness of the instruments used should be reviewed. The statistical confidence in the estimates should be independently evaluated by the staff. Designation as a "trace concentration" should be reviewed.

Characteristic techniques should be compared to the principles outlined in 10 CFR 61.55(a)(8), i.e., values based on direct measurements, indirect methods related to measurements, or material accountability.

The variability and potential changes in the waste form as a function of process variation and among licensees should be reviewed.

At a minimum the following information should be provided.

- o Waste characterization (verify uniformity of distribution)
- o Total quantities produced
- o Methods used for monitoring

Analytical data and calculations used should be specified. Actual measurements or values that can be related to measurements to confirm calculations are important. The statistical confidence in the estimates should be evaluated.

- o Describe number of samples measured
- o Representation of the samples
- o Instruments used
- o Statistical method

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 7: "The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category."

Criterion 8: "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses."

Criterion 9: "The waste characterization is based on data on real wastes."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR 2.802, "Petition for Rulemaking."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the basis for the waste stream characterization and the total quantities produced, including quality assurance aspects relative to the criteria listed above. Considerations on total inventory of disposal (quantity produced) and the statistical confidence in the estimates should be described.

## 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the petitioner has adequately characterized the proposed waste stream for exemption from disposal in a licensed low-level waste disposal facility. The staff agrees with the petitioner that the waste stream meets the applicable policy criteria contained in Appendix B to 10 CFR Part 2, and can be managed as proposed.

The staff finds that the petitioner has adequately characterized the proposed waste stream for exemption from disposal in a licensed low-level waste disposal facility. However, the staff considers that the waste stream does not meet the applicable criteria contained in Appendix B to 10 CFR Part 2, and is unsuitable for treatment and disposal as proposed. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

The staff finds that the petitioner has not characterized the proposed waste stream for exemption sufficiently to allow a realistic or conservative estimation of the impacts of the proposed treatment and disposal. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.



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## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



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STANDARD REVIEW PLAN 2.5

B. WASTE CHARACTERIZATION

AS LOW AS REASONABLY ACHIEVABLE (ALARA)

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AS LOW AS REASONABLY ACHIEVABLE (ALARA)

This section of the petition shall comply with 10 CFR 20.1(c), the Commission's ALARA requirement. Licensee compliance with 10 CFR 20.1(c) is a precondition to acceptance by NRC of any waste stream as exempt.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the information supplied by the petitioner to comply with (ALARA). The Commission's ALARA requirement in 10 CFR 20.1(c) applies to efforts by licensees to maintain radiation exposures and releases of radioactive materials in effluents to unrestricted areas as low as reasonable achievable. 10 CFR Part 50, Appendix I, describes ALARA for radioactive materials in light water reactor effluents. Licensee compliance with 10 CFR 20.1(c) is a precondition to acceptance by NRC of any waste stream as exempt.

The staff will review petitioner's description of reasonable procedures that waste generators would be expected to use to minimize radiation exposures resulting from the disposal of the exempt waste, e.g., removal of surface contamination. These procedures are assumed to apply prior to characterizing the waste to be exempted.

NOTE: The policy statement and plan strategy is based on evaluating real or actual wastes and examining the results of the dosage data. The intent of the ALARA discussion in the plan was to make sure that no obvious action had been overlooked that would reduce the quantities of radioactivity proposed for exemption or the associated risks. A qualitative discussion that cross-references other portions of the petition and reflects a conscious consideration would be an acceptable approach to ALARA, as long as it reasonably demonstrated that the waste proposed for exemption contains necessary and unavoidable contamination.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

This section of the petition is reviewed to identify any missing data, information, or analyses necessary for the staff's evaluation.

The staff will evaluate the activities and processes which produce the waste to identify potential procedures that could be used to minimize the presence of removable contamination on both internal and external surfaces of waste materials. Reasonable measures to minimize the waste volume should also be considered.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 5, "The exemption will result in a significant reduction in societal costs."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of subsequent responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of reasonable procedures that waste generators would be expected to use to minimize radiation exposures resulting from the disposal of the exempt waste, e.g.,

removal of surface contamination on both internal and external surfaces of waste material relative to the criteria listed above. Reasonable measures to minimize the waste volume should also be considered.

## 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the proposed ALARA procedures would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the proposed ALARA procedures may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.

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### STANDARD REVIEW PLAN 3.1 C. WASTE MANAGEMENT OPTIONS

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#### C. WASTE MANAGEMENT OPTIONS

This section of the petition describes the waste treatment/disposal options.

#### 1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.3 Support - None

#### 2. AREAS OF REVIEW

The staff shall review the waste treatment/disposal options supplied by the petitioner. The disposal options that the Commission can deal with expeditiously are those described in NUREG/CR-3585, "De Minimus Waste Impacts Analysis Methodology." Onsite options include incineration and burial. Off-site treatment and disposal options are municipal waste disposal facilities (sanitary landfills), municipal waste incinerators, hazardous disposal facilities, and hazardous waste incinerators. Pretreatment, e.g., shredding of otherwise potentially recyclable materials, is a potential adjunct to either onsite or offsite options. Combinations of these options can also be evaluated. For example, wastes may be incinerated on site and the ash shipped to a sanitary landfill. The favored disposal options should be identified and fully described. The petitioner should evaluate a full range of options. The practicality of



the proposed option(s) should be reviewed by staff. The petition should contain a quantitative evaluation of the indicated impacts from the proposed waste for each disposal option. If the petitioner is aware of other impacts which should be considered for the specific wastes in the petition, the petitioner should also have addressed the additional impacts.

Waste compatibility with requirements associated with the proposed disposal options should be reviewed. If the petitioner proposes that the wastes be incinerated on site, the waste form should be shown to be combustible at the temperatures, flow rates, feed rates, and other operating parameters of typical incinerators that licensees may have on site. The petitioner should identify the minimum requirements the incinerator must meet to assure adequate combustion. As discussed earlier, the staff will contact a limited number of facilities actually operating incinerators to verify these characteristics. The waste form to be incinerated should be compatible with other local, State, or Federal requirements. Similar consideration for disposal at sanitary landfills or hazardous waste sites should be addressed. For example, wastes that include components or properties that would qualify the waste as a "hazardous waste" under EPA rules in 40 CFR Part 261 should not be proposed for disposal at a municipal landfill. The national availability and distribution of the option should also be reviewed. Updates on national regulations and laws pertaining to the proposed option should be described and might have to be considered in selecting acceptable options.

NOTE: A suggestion to consider a full range of options, including incineration, is consistent with NEPA even though not addressed in 10 CFR 2.802. Staff did not intend "best" available method. An acceptable NEPA finding would be that there is no obviously superior method. The review of waste treatment/disposal in part meets NEPA requirements but also in part encourages flexibility in options to make the exemption more useful to waste generators. The most efficient approach is for NRC and the petitioner to readily evaluate other options in a single rulemaking. Waste characterization is likely to be the most resource intensive aspect along with the rulemaking process. It would not seem to be efficient to conduct several rulemakings on one waste stream, i.e.,

separate rules for incineration onsite, incineration offsite, and landfilling of the same waste, particularly when alternatives must be addressed under NEPA.

Concern about laws and regulations applicable to disposal options stems from modeling concerns and implementation. The laws and regulations could directly influence the assumptions used to calculate potential exposures. How the wastes are handled and treated, how the facility is designed and operated, and the nature and type of institutional controls are factors in calculating expected doses. Each of these could be impacted by laws and regulations. Certain assumptions concerning factors such as these are included in the computer program IMPACTS-BRC and there is concern that these assumptions remain valid. See the discussion on regulatory obstacles (Criterion 14) for implementation concerns. Licensees will have to comply with other applicable requirements (e.g., those imposed on the nonradiological properties). The petitioner is in the best position to identify these other requirements and assess how they might impact potential exposures and implementation.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The waste treatment/disposal options shall be reviewed by staff to identify any missing data, information, or analyses necessary for the staff's evaluation. The information supplied by petitioner will be evaluated using the methods described in NUREG/CR-3585, and staff positions will be developed based on the results of the analysis.

The staff will review the analyses, as previously discussed, by running the IMPACTS-BRC program with waste stream input, for each disposal option, supplied by petitioner using default environmental and facility data. Staff will evaluate the waste form for variability and potential for change as a function of process variation, as well as petitioner's description of the variation and bounds among licensees.

Staff shall assess the impact of proposal option(s) on current national regulations and laws.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 6. "The waste is compatible with the proposed treatment and disposal options."

Criterion 7. "The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category."

Criterion 8. "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses."

Criterion 9. "The waste characterization is based on data on real waste."

Criterion 10. "The disposed of form of the waste has negligible potential for recycle."

Criterion 11. "Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance."

Criterion 12. "The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes."

Criterion 13. "The method and procedures used to manage the wastes and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials."

Criterion 14. "There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern." 51 Fed. Reg. 30839, August 29, 1986.

10 CFR 2.802, "Petition for Rulemaking."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

40 CFR Environmental Protection Agency (Part 261).

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the waste treatment/disposal options, including potential impacts, critical pathways and critical nuclides identified and modifications or alternatives to the IMPACTS-BRC methodology. The practicality of the proposed option(s), and waste compatibility should be described relative to the criteria listed above. Findings of practical or legal constraints should be described.

### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the proposed waste treatment/disposal options of the waste stream would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the proposed waste treatment/disposal options of the waste stream may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the proposed waste treatment/disposal of the waste stream may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, reference on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Waste Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.

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NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 4.1  
D. ANALYSES  
RADIOLOGICAL IMPACTS

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D. ANALYSES

An overall analyses of the (1) radiological impacts associated with handling, transport, and disposal of the specific wastes, and (2) any incremental nonradiological impacts, and (3) a detailed regulatory analysis (including alternative options) to support and justify the submittal is presented.

RADIOLOGICAL IMPACTS

This section of the petition presents an analyses of the radiological impacts associated with handling, transport, and disposal of the specific wastes to support and justify the submittal.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review petitioner's analyses of the radiological impacts associated with handling, transport, and disposal of the specific wastes to

support and justify the submittal. The effective whole body dose equivalent (ICRP 1978) is assessed for the proposed action. Scenarios include transportation, operations, air and water transport to offsite receptors, accidents, and intrusion into disposed waste. The petitioner should have used the analyses, i.e., IMPACTS-BRC or an alternative calculational method to prepare and submit a detailed regulatory analysis with the petition. The evaluation of radiological impacts should distinguish between expected and potential exposures and events. Impacts should have been assessed for the expected concentrations and quantities of radionuclides. The petitioner should have quantitatively evaluated the impacts from the proposed waste for each treatment/disposal option requested. The petition should clearly relate the analytical findings to specific provisions in the recommended rule changes. For example, the basis for each recommended radionuclide limit should be clearly explained. Assumptions, calculational techniques, and results will be described in sufficient detail to allow a thorough independent evaluation of the assessment.

The Methodology described in NUREG/CR-3585, De Minimus Waste Impacts Analysis Methodology, Volume 1, can be used to calculate the radiological impacts from operations, transportation, treatment, and disposal operations. NRC's computer program (IMPACTS-BRC) covers exposures to workers and individual members of the public and cumulative population exposures. The program calculates both external direct gamma exposures and exposures from ingested or inhaled radionuclides. NRC's computer program can be used to calculate the expected radiological impacts from generator activities, transportation, treatment, disposal operations, and impacts from post-disposal. Post-disposal impacts that can be calculated include releases due to intrusion, ground-water migration, erosion, and leachate accumulation. The program thus addresses both expected and potential post-disposal impacts. The program can analyze a wide range of waste treatment/disposal options including onsite treatment and disposal by the generator, transport to municipal waste management facilities and transport to hazardous waste management facilities. The program covers impacts beginning with initial handling and treatment by the generator through final disposal of all the radionuclides contained in the waste stream. Treatment, sorting, and incineration onsite and at municipal and hazardous facilities can be assessed. Disposal of resulting ash and residue is included.

If the petitioner was aware of any other impacts they should have been clearly described. The analysis of expected radiological impacts should clearly address:

- The maximum individual exposures.
- The critical population exposures.
- The cumulative population exposures.

The petitioner should clearly relate the analytical findings to the specific provisions in the recommended rule changes. For example, the basis for each recommended radionuclide limit should be clearly explained. The analysis of impacts may show that limiting concentrations of individual radionuclides will assure that exposures to individuals, groups, and the general population will be small. However, for certain radionuclides and exposure pathways, site inventories or volumes may need to be limited to keep potential exposures small (e.g., the analysis may show that more than 100 millicuries of a radionuclide in a single landfill could result in potential individual exposures from the ground-water pathway of more than one millirem per year).

The maximum individual exposure evaluation should include exposures to all members of the public who may be exposed beginning with the initial handling at the generator's facility through post-closure. Both internal uptake and external exposures should be included. The individual may be a member of the general population (e.g., consumer of contaminated ground water) or a person receiving the exposure from his or her occupation. Anyone who may be exposed and is not a radiation worker should be considered a member of the public. For example, a worker at a sanitary landfill or commercial trash truck driver would not be a radiation worker. However, occupational exposures to radiation workers should be evaluated and considered in the cost/benefit analysis of the incremental impacts between disposal at a licensed facility and the requested disposal options.

The total population exposures can be estimated and summed in two parts. One part is the smaller critical group (usually the occupationally exposed population) where potential exposures may be higher on an individual basis but the exposures

and the number of exposed individuals are more predictable and the exposures are short-term. The critical group should be the segment of the population most highly exposed exclusive of radiation workers. The other part is the general population where the expected exposure and size of the exposed population are less predictable, potential individual exposures are probably much smaller, and exposures may extend over longer time frames. Presentation of the population exposures in these two parts should contribute to a more meaningful cost/benefit analysis.

The petitioner's analysis should also address potential exposures from handling and transport accidents and from intrusion or loss of institutional control at municipal or hazardous sites at times sooner than the normal controlled lifetime of such facilities (e.g., 30 years of post-closure control of hazardous sites). Transportation accidents were not expressly included in NUREG/CR-3585. The petitioner's analysis of accidents should include all assumptions, data, and results to facilitate review.

The petitioner's analysis of transport impacts should be based on a reasonably expected spacial distribution of licensees and waste treatment and disposal facilities which will accept the wastes. The petitioner should address parameters such as average and extreme transport distances. The petitioner's analysis should address the basis for parameter selection and characterize the expected patterns (e.g., indicate how likely the extreme case may be). The petitioner's analysis of accidents should include all assumptions, data, and results to facilitate review. The potential for shipment of the entire waste stream to one or a few facilities should be assessed. This scenario currently exists for 10 CFR 20.306 exempted liquid scintillation wastes and might result from very limited numbers of treatment facilities or decontamination services. The analysis of impacts for transport, handling, and disposal should include evaluation of this potential circumstance unless it can be clearly ruled out.

The International Commission on Radiological Protection (ICRP) expressed in Paragraph 89 on page 20 of its ICRP Publication 46 that:

Exception from regulation and requirements on these bases should not be used to make it possible to dispose of large quantities of radioactive materials in diluted form, or in divided portions, causing widespread pollution which would eventually build up high dose levels by the addition of many small doses to individuals. Nor should they be used to exempt activities that, by isolation or treatment, have been made temporarily harmless but that imply large potential for release and could give rise to high individual doses or high collective doses.

Information which should be submitted with the application includes:

- All specific input values needed to analyze waste using IMPACTS-BRC and basis for the specific input values.
- Written and/or computer printout copies, and a floppy diskette, containing the data files used to run IMPACTS-BRC on the proposed BRC waste stream
- Output of IMPACTS-BRC
- Written and/or computer printout copies, and a floppy diskette, containing the data files and FORTRAN source code for alternative calculational techniques
- Output of alternative calculational techniques
- Detailed discussion of differences between petitioner's analyses and those described in NUREG/CR-3585
- All information on additional impacts to allow independent evaluation of assumptions, calculations, and results
- Summary of radiation dose equivalents to the maximally exposed individual.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The assessment of radiological impacts shall be reviewed by staff to identify any missing data, information, or analyses necessary for the staff's evaluation. The information supplied by petitioner will be evaluated using the methods

described in NUREG/CR-3585, and staff's position will be developed based on the results of the analysis.

The staff will review the analyses, as previously discussed, by running the IMPACTS-BRC program with waste stream input supplied by the petitioner. Staff will perform a thorough independent evaluation of the assessment associated with the handling, transport and disposal of the specific waste stream, including all waste disposal options proposed by petitioner.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 1: "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

Criterion 2: "The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events."

Criterion 3: "The collective doses to the critical population and general population are small."

Criterion 4: "The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal site after loss of normal institutional controls are not significant."

Criterion 5: "The exemption will result in a significant reduction in societal costs."

Criterion 8: "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses.

Criterion 12: "The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes."

Criterion 13: The methods and procedures used to manage the waste and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials.

#### 4.2 Regulatory Requirement

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern." 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

10 CFR Part 20, "Standards for Protection Against Radiation."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the radiological impacts associated with handling, transport and disposal of the specific wastes, including potential impacts, and critical and cumulative population exposures. The staff will summarize the bases and findings on the radiological impacts relative to the criteria listed above. The criterion which is limiting in terms of allowable concentrations and total mass of nuclides will be highlighted. Disposal or changes in waste stream characterization which would lead to changes in the safety of the treatment and disposal of the waste stream for exemption should be described.

### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the proposed exclusion of the waste stream from regulation and management as LLW would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the proposed exclusion of the waste stream from regulation and management as LLW may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (and other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the proposed exclusion of the waste stream from regulation and management as LLW may potentially result in impacts



exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.

5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 4.2  
D. ANALYSES  
OTHER IMPACTS

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OTHER IMPACTS

This section of the petition presents an assessment of the potential nonradiological impacts and any other impacts associated with the requested action.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review petitioner's assessment of the potential nonradiological impacts and any other impacts associated with the requested action. NRC's action to exempt the radiological content of the wastes would not relieve persons handling, processing, or disposing of the wastes from requirements applicable to the nonradiological properties. The waste should not qualify as a nonradiological hazardous material if unrestricted disposal options are to be used. If the waste does qualify as nonradiological hazardous material, the proposed disposal method (incineration or disposal at a hazardous waste

facility) should be in accord with EPA, State, and local regulations. Staff shall review the petitioner's assessment of the nonradiological properties of the radioactive waste to evaluate whether it demonstrates that the nonradiological properties of the radioactive waste are the same as the nonradioactive materials normally handled and disposed of by the proposed methods. If the nonradiological properties are similar and the volumes of exempted waste would not impact the normal operations, there should be no incremental impacts. If the petitioner was aware of other impacts which should have been considered for the specific wastes in the petition, the petitioner should have addressed the additional impacts for staff evaluation.

The nonradiological properties of the waste stream should be reviewed to assure that they are consistent with the proposed disposal method and to evaluate the adequacy of the analysis of the radiological impacts.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The assessment of other impacts shall be reviewed by staff to identify any missing data, information, or analyses necessary for the staff's evaluation.

The information supplied by the petitioner relevant to the nonradiological impacts and any other impacts identified, will be evaluated for any incremental impacts and staff's position will be developed based on the results of the analysis.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 1: "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

Criterion 5: "The exemption will result in a significant reduction in societal costs."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of nonradiological impacts and any other impacts associated with the waste stream. The staff will summarize the bases and findings of the nonradiological impacts relative to the criteria listed above.

## 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the nonradiological impacts of the waste stream would not result in exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the nonradiological impacts of the waste stream may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and consideration such as the conservative nature of the methods used to assess impacts (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the nonradiological impacts of the waste stream may potentially result in health and safety impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2, therefore, precluding exclusion from regulation and management as LLW. The staff recommends that, on this basis, the petition be denied and the waste be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

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## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.



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Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 4.3  
D. ANALYSES  
REGULATORY ANALYSIS

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REGULATORY ANALYSIS

This section of the petition presents a regulatory analysis in support of the requested action.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Radiation Protection Branch (PRPB)  
Office of Nuclear Reactor Regulation (NRR)

Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

The staff shall review the regulatory analysis supplied by the petitioner, which should include, (1) a statement of the problem, (2) reasonable alternatives considered for achieving the specific regulatory objectives, (3) consequences of each alternative including (a.) costs and benefits, (b.) impacts on other requirements and (c.) constraints that affect the implementation of the alternative, including scheduling, enforceability, policy or legal constraints, (4) decision rationale, explaining why the preferred alternative should be selected, and (5) implementation covering the steps and schedules for actual implementation of the proposed rule. The petitioner should have followed the guidance for preparation and format of a regulatory analysis contained in NUREG/BR-0058, Rev. 1, "Regulatory Analysis Guidelines of the U.S. Nuclear



Regulatory Commission, 1984, referenced in the Commission Policy Statement on BRC "to expedite the subsequent rulemaking if the petition is granted."

A cost/benefit discussion is an essential part of both environmental and regulatory impact considerations and, therefore, the Commission considers it essential to expedited handling. The discussion should focus on expected exposures and realistic concentrations or quantities of radionuclides. The cost/benefit discussion should include the differential exposure and economic costs between disposal at a licensed low-level waste disposal site and the proposed option(s). It may also include qualitative benefits. Reduced hazards from not storing hazardous or combustible materials might be a benefit. Elimination or reduction of the hazardous properties (e.g., by incineration) could be another. Detrimental costs might also be qualitative such as loss of space in municipal or hazardous waste sites. The economic impact on the licensed site operations (i.e., loss of income from diverted wastes) and its potential effect on the availability of economic and safe disposal should be addressed. Costs of surveys and verifying compliance discussed under Topic II.E. Recordkeeping and Reporting should also be covered. The cost/benefit should also reflect ALARA considerations. Radiation workers exposure, public exposure, and environmental releases might be appropriate in ALARA considerations. In weighing the exposure costs and economic costs for light-water-cooled nuclear reactor wastes, the petitioner could use, for perspective, the \$1,000 per person-rem guideline in 10 CFR Part 50, Appendix I, for effluent releases from these facilities.

The petitioner should have identified legal or regulatory constraints that might impact implementation of the petitioned change. The compatibility of the waste with the proposed method of disposal was discussed under Topic II.B.2. Other constraints might stem from Department of Transportation (DOT) labeling, placarding, and manifesting requirements for radioactive materials. Since the receiving facility will not be licensed to receive radioactive materials, this could be an impediment to implementation. For most radioactive materials, the general DOT threshold limits of 0.002 microcuries per gram apply. However, the DOT issued a final rule on June 6, 1985 (50 FR 23811) that amended 49 CFR Part 173 to exempt low specific activity wastes as described in NRC's rules in

10 CFR 20.306 (Note that DOT emphasized that the wastes remain subject to the provisions related to other hazards; see 49 CFR 173.425(d)).

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The regulatory analysis shall be reviewed by staff to identify any missing data, information, or analyses necessary for the staff's evaluation. The staff will review and evaluate the analytical findings, cost/benefit discussion, bases for decisions, and subsequent impact on the health and safety of the environment.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 1: "Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment."

Criterion 5: "The exemption will result in a significant reduction in societal costs."

#### 4.2 Regulatory Requirements

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

10 CFR 2.802, "Petition for Rulemaking."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

49 CFR Department of Transportation (Part 173).

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the regulatory analysis submitted in support of a petition for rulemaking on radioactive waste below regulatory concern (BRC) relative to the criteria listed above. The staff will summarize the bases and findings of all alternatives, including the preferred alternative, relative to the specific waste stream and the health and safety of the environment.

#### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the regulatory analysis supports the proposed exclusion of the waste stream from regulation and management as LLW and would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2 and would result in negligible health and safety impacts.

The staff finds that the regulatory analysis does not fully support the proposed exclusion of the waste stream from regulation and management as LLW, and may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the regulatory analysis does not support the proposed exclusion of the waste stream from regulation and management as LLW and may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.
6. NRC, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Rev. 1, May 1984.

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NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 5.1  
E. RECORDKEEPING AND REPORTING  
SURVEYS

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E. RECORDKEEPING AND REPORTING

Recordkeeping and reporting to address uncertainties in projecting future volumes or amounts of wastes and to evaluate the cumulative impacts of multiple exemptions shall be reviewed by NRC staff. Appendix A of NUREG/BR-0058, Rev. 1, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission" addresses any information collection requirements the petitioner may need to address to facilitate NRC filing for OMB approval in accordance with P.L. 96-511, "The Paperwork Reduction Act," and will be used by NRC staff to evaluate the proposed recordkeeping and reporting program.

SURVEYS

This section of the petition shall comply with the regulations contained in 10 CFR §20.201 covering "Surveys."

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.3 Support - None

2. AREAS OF REVIEW

Existing regulations in §10 CFR 20.201 establish general NRC requirements for performing surveys as necessary to comply with Part 20. The staff shall



review petitioner's information regarding surveys, to be conducted by licensees, of the waste properties prior to release for exempt disposal to verify that the waste meets the prescribed limits.

Such survey programs might consist of:

- (1) fairly comprehensive initial sampling and analysis to confirm that the licensee's wastes will fall below the limits,
- (2) periodic analysis as part of a process or quality control program to confirm the initial findings,
- (3) a routine survey program prior to release of wastes to monitor for gross irregularities.

The petitioner should describe a sample survey program to demonstrate that licensees can be expected to conduct compliance surveys prior to waste transfer. The three components just discussed should be included, if appropriate, for the waste stream. Records of the surveys would be maintained for inspection. As previously indicated, Appendix A of NUREG/BR-0058, Rev. 1, addresses the information needs petitioner should address to facilitate NRC filing for OMB approval on information collection when necessary.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

Staff will use the guidelines contained in NUREG/BR-0058, Rev. 1 to evaluate the proposed recordkeeping and reporting program. The survey description shall be reviewed by staff to identify any missing data or information necessary for the staff's evaluation. The staff will review and evaluate the program in accordance with applicable regulations.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Criterion 11: "Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance."

##### 4.2 Regulatory Requirement

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

##### 4.3 Regulatory Guides

None

##### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

## 5. EVALUATION FINDINGS

### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the survey program submitted in support of a petition for rulemaking on radioactive waste below regulatory concern (BRC) relative to the criteria listed above.

### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the survey program, in support of the proposed exclusion of the waste stream from regulation and management as LLW, is in accordance with applicable regulations and would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2, and would result in negligible health and safety impacts.

The staff finds that the survey program, in support of the proposed exclusion of the waste stream from regulation and management as LLW, is in accordance with applicable regulations, but may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the proposed survey program, in support of the exclusion of the waste stream from regulation and management as LLW, may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.

6. NRC, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Rev. 1, May 1984.



NUREG-1351

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards

**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 5.2  
E. RECORDKEEPING AND REPORTING  
REPORTS

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REPORTS

This section of the petition presents the recordkeeping and reporting program in support of the proposed action.

1. RESPONSIBILITY FOR REVIEW

1.1 Primary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)

1.2 Secondary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)

1.3 Support - None

2. AREAS OF REVIEW

Recordkeeping and reporting to address uncertainties in projecting future volumes or amounts of wastes and to evaluate the cumulative impacts of multiple exemptions shall be reviewed by NRC staff. Appendix A of NUREG/BR-0058, Rev. 1, addresses the information needs which the petitioner should have addressed to facilitate NRC filing for OMB approval, and will be used by staff to evaluate the proposed recordkeeping and reporting program.

The petitioner should assume that annual reports on disposals will be required and that associated recordkeeping to generate the reports will be imposed. Staff will review petitioner's program for inclusion of the following minimum information in the annual reports:

- Waste type
- Volume
- Estimated curie content
- Place and process of disposal

Increased recordkeeping and reporting requirements would address uncertainties in projecting future volumes or amounts of wastes and NRC's responsibility to consider the cumulative impacts of multiple exemptions. When these requirements are proposed, Office of Management and Budget (OMB) approval is required.

To facilitate NRC filing for OMB approval, the petitioner should have included the following information:

- Duplicative or overlapping reporting requirements
- Number and type of expected respondents
- Suggestions for minimizing the burden
- Estimates of staff hours and costs to prepare the reports and keep records
- Brief description of basis for estimates.

The petitioner should also have addressed whether changes in technical specifications or licenses may be needed.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The proposed recordkeeping and reporting program shall be reviewed by staff to identify any missing data or information necessary for the staff's evaluation. The staff will review and evaluate the program in accordance with applicable laws and regulations.

#### 4. ACCEPTANCE CRITERIA

##### 4.1 Decision Criteria

The following decision criteria contained in Section II of the Commission Policy Statement, 10 CFR Part 2, Appendix B, pertain to this SRP.

Procedural Requirement (OMB).

Criterion 8, "The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses."

##### 4.2 Regulatory Requirement

The regulations applicable to this SRP are

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern."

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

NRC Manual Chapter 0230, "Federal Reports Management."

Public Law 96-511, "The Paperwork Reduction Act."

##### 4.3 Regulatory Guides

None



#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the recordkeeping and reporting program submitted in support of a petition for rulemaking on radioactive waste below regulatory concern (BRC). The findings will address uncertainties in projecting future volumes or amounts of wastes and the bases for the estimates relative to the criteria listed above.

#### 5.2 Sample Evaluation Findings

The findings should include one of the following statements:

The staff finds that the proposed recordkeeping and reporting program would not result in exceedence of the established policy criteria contained in Appendix B to 10 CFR Part 2 and would result in negligible health and safety impacts.

The staff finds that the proposed recordkeeping and reporting program may potentially result in impacts slightly exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. However, the degree to which the criteria are exceeded and considerations such as the conservative nature of the methods used to assess impacts and the petitioner's proposed monitoring program (add other measures as appropriate) indicate that the exclusion would result in negligible health and safety impacts.

The staff finds that the proposed recordkeeping and reporting program may potentially result in impacts exceeding the established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that, on this basis, the petition be denied and the waste stream be regulated and managed as LLW.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

## 7. REFERENCES

In addition to the following, references on methods and techniques of analysis and published data by Federal and State agencies will be used as available.

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O.I., and G.W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, Feb 1984.
2. Forstrom, J.M., and D.J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Wastes Below Regulatory Concern, Vol. 2, NUREG/CR-3585, Jul 1986.
3. Oztunali, O.I., and G.W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.

4. NRC, FEIS on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, Nov 1982.
5. NRC, DEIS on 10 CFR Part 61, "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, Sep 1981.
6. NRC, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Rev. 1," May 1984.

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**PETITIONS FOR RULEMAKING ON RADIOACTIVE WASTE STREAMS  
BELOW REGULATORY CONCERN**

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STANDARD REVIEW PLAN 6.1  
F. PROPOSED RULE

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PROPOSED RULE

This section of the petition contains the text for the proposed rule. The section should meet the criteria of Appendix B to 10 CFR Part 2. (See also 10 CFR 2.802.)

1. RESPONSIBILITY FOR REVIEW

- 1.1 Primary - Regulatory Branch (RB)  
Office of Nuclear Material Safety and Safeguards (NMSS)
- 1.2 Secondary - Radiation Protection and Health Effects Branch (RPHEB)  
Office of Nuclear Regulatory Research (RES)
- 1.3 Support - Office of the General Counsel (OGC)

Office of the Secretary (SECY)

Office of Administration (ADM)

2. AREAS OF REVIEW

Petitions for rulemaking on waste streams that may be below regulatory concern shall be reviewed for compliance with 10 CFR Part 2, Appendix B, General Statement of Policy and Procedures Concerning Petitions Pursuant to §2.802 for Disposal of Radioactive Waste Below Regulatory Concern.

The petition should include the text for the proposed rule. Staff shall review the proposed text for, at a minimum, the following information:

- (1) The quantity and/or concentration limit for each radionuclide present (trace radionuclides could be lumped together with a total limit);

- (2) A method to deal with radionuclide mixtures;
- (3) The nonradiological specifications necessary to adequately define the waste; and
- (4) The specific method(s) of exempt disposal.

If practicable, and if the supporting information indicates the need, the text should also address other features such as annual limits on each generator in terms of volume, mass or total radioactivity, and administrative or procedural requirements including process controls, surveys, etc., that were previously discussed. The text should not include the various dose limits used to justify the proposed radionuclide limits.

### 3. REVIEW PROCEDURES

#### 3.1 Acceptance Review

The text of the proposed rule shall be reviewed by staff to identify any missing data or information necessary for the staff's evaluation. The staff will review and evaluate the proposal in accordance with applicable laws and regulations. The staff will also review and evaluate the bases for decisions and the subsequent impact on the health and safety of the environment.

### 4. ACCEPTANCE CRITERIA

#### 4.1 Decision Criteria

Procedural

#### 4.2 Regulatory Requirements

The regulations applicable to the SRP are

10 CFR 2.802 "Petition for Rulemaking"

10 CFR Part 2, Appendix B, "General Statement of Policy and Procedures Concerning Petitions Pursuant to 2.802 for Disposal of Radioactive Waste Below Regulatory Concern," 51 Fed. Reg. 30839, August 29, 1986.

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

#### 4.3 Regulatory Guides

None

#### 4.4 Regulatory Evaluation Criteria

The applicant should clearly acknowledge, by reference to codes, statutes, or regulations, its responsibilities to various authorities. Additionally, certification of this responsibility should be verifiable and legally binding.

### 5. EVALUATION FINDINGS

#### 5.1 Introduction

The findings will summarize the petitioner's and staff's assessment of the text for the proposed rule relative to the criteria listed above.

#### 5.2 Sample Evaluation Findings

The findings shall include one of the following statements:

The staff finds that the proposed Federal Register Notice has adequately addressed the overall impacts of the proposed action, waste properties,

and implementation of the proposed exemption in accordance with applicable regulations and established policy criteria contained in Appendix B to 10 CFR Part 2.

The staff finds that the proposed Federal Register Notice has not adequately addressed the overall impacts of the proposed action, waste properties, and implementation of the proposed exemption in accordance with applicable regulations and established policy criteria contained in Appendix B to 10 CFR Part 2. The staff recommends that the petitioner resubmit the proposed Notice.

## 6. IMPLEMENTATION

This review plan provides guidance to the NRC staff in its initial acceptance review and the overall technical review of a petition for rulemaking on radioactive waste below regulatory concern. In addition it may be used as guidance by petitioners regarding NRC's plan for performing such a review.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with the specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations and policy.

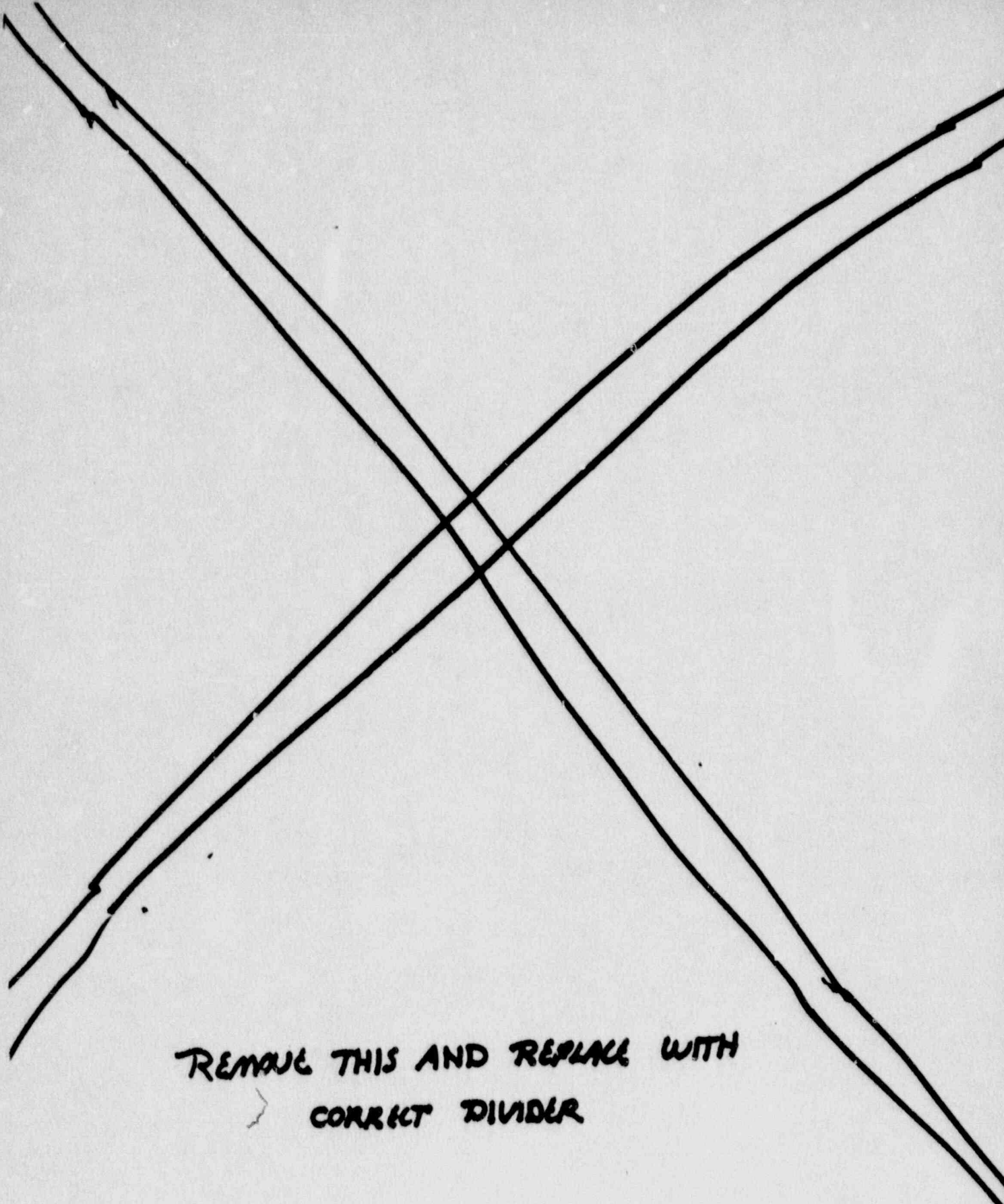
## 7. REFERENCES

See section 4.2 of this SRP for a listing of applicable regulations.

1. Oztunali, O. I., and G. W. Roles, De Minimus Waste Impacts Analysis Methodology, Vol. 1, NUREG/CR-3585, February 1984.
2. Forstrom, J. M., and D. J. Goode, De Minimus Waste Impacts Analysis Methodology: IMPACTS-BRC User's Guide and Methodology for Radioactive Waste Below Regulatory Concern, Vo. 2, NUREG/CR-3585, July 1986.



3. Ozt'mali O. I., and G. W. Roles, Update of Part 61 Impacts Analysis Methodology, NUREG/CR-4370, 1986.
4. NRC, FEIS on 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," NUREG-0945, November 1982.
5. NRC, DEIS on 10 CFR Part 61 "Licensing Requirement for Land Disposal of Radioactive Waste," NUREG-0782, September 1981.
6. NRC, "Regulation Handbook," NUREG/CR-0053, Rev. 1, November 1987.



REMOVE THIS AND REPLACE WITH  
CORRECT DIVIDER

### III. Decision Criteria

The Commission policy statement establishes that the following criteria should be used by staff as guidelines for acting on a petition. Each criterion is repeated and staff views on implementation are discussed.

1. Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment.

*Discussion:* Unless this finding can be made during information submitted by the petitioner, the Commission must prepare an Environmental Impact Statement to more fully examine the proposed action, alternatives to the proposed action, and associated potential impacts of alternatives. Preparation would likely involve contractual support and would likely take 2 years or more to complete. The Commission could not act in the petition in an expedited manner.

2. The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events.

*Discussion:* The effective dose equivalent means the ICRP Publication 26 and 30<sup>3</sup> sum of the dose from external exposure and the dose incurred from that year's intake of radionuclides. While a range of 1-10 millirem per year might be acceptable, a one millirem dose would facilitate expedited processing. Higher doses may require more extensive justification. Based on a mortality risk coefficient for induced cancer and hereditary effects of  $2 \times 10^{-4}$  per rem (ICRP Publication 26), radiation exposure at a level of millirem per year would result in an annual mortality risk of  $2 \times 10^{-7}$  (i.e.,  $2 \times 10^{-4}$  effects/rem  $\times 10^{-3}$  rem/year).

The EPA is developing criteria for identifying low-level radioactive waste that may be below regulatory concern as part of that agency's development of general environmental standards for low-level waste disposal. The EPA published an Advance Notice of Proposed Rulemaking on August 31, 1983 (48 FR 39563) and currently hopes to publish proposed standards in early 1987. Other EPA standards that the doses can be compared to are the Clean Air Act radioactive release standard of 25 millirems per year in 40 CFR Part 61 and the uranium fuel cycle annual whole body limit of 25 millirems in 40 CFR 190.

One millirem is very small when compared to naturally occurring background doses from cosmic and

terrestrial sources. Background doses in the United States are typically in the 100-120 millirems per year range exclusive of the lung doses from radon. One millirem is also small when compared to the annual 500 millirem dose limit for individual members of the general public in Federal Radiation Council guidance.

An important feature is that doses of up to 1 millirem from the individual petition should minimize concerns over exposure to multiple exempted waste streams. ICRP Publication 46 addressed individual dose limits and other issues related to exemptions and stated, in paragraphs 83 and 84 on page 19:

Many radiation exposures routinely encountered in radiation protection, particularly those received by members of the public, are very small by comparison with dose limits or natural background, and are well below dose levels at which the appearance of deleterious health effects has been demonstrated. In individual-related assessments, it is widely recognized that there are radiation doses that are so small that they involve risks that would be regarded as negligible by the exposed individuals. Studies of comparative risks experienced by the population in various activities appear to indicate that an annual probability of death of the order of  $10^{-4}$  per year or less is not taken into account by individuals in their decisions as to actions that could influence their risks. Using rounded dose response factors for induced health effects, this level of risk corresponds to an annual dose of the order of 0.1 mSv [10 millirem].

However, in most practical cases, the need for exemption rules arises in source-related assessment, to decide whether a source or waste stream should be subject to control. Consideration should be given to the need for any optimization of radiation protection and to the possibility that many practices and sources of the same kind could combine now or in the future so that their total effect may be significant, even though each source causes an annual individual dose equivalent below 0.1 mSv [10 millirem] to individuals in the critical group. This may involve assessments of dose commitments and of the collective dose per unit practice or source, in order to ensure that the individual dose requirement will not be exceeded now or in the future. It seems almost certain that the total annual dose to a single individual from exempted sources will be less than ten times the contribution from the exempted source giving the highest individual dose. This aspect could, therefore, be allowed for by reducing the annual individual dose exemption criterion from 0.1 to 0.01 mSv [10 to 1 millirem].

The NRC staff recognizes that at times, human reactions are not so strictly governed by quantitative considerations as the ICRP excerpt suggests. Nevertheless, the  $10^{-4}$  per year value seems about as low as practicable.

seems too low to justify significant concern, and so seems acceptable.

The United Kingdom's National Radiological Protection Board has issued generic guidance on de minimis dose levels (ASP-7, January 1985)<sup>4</sup> that has status similar to Federal Radiation Guidance issued by the President in this country. The Board identified effective dose equivalents of 5 millirem per year as insignificant when members of the public make their decisions. The 5 millirem limit represents the total dose contribution from all exempted practices. For individual practices, the Board divided by 10 (i.e., 0.5 millirem per year) to account for exposures from multiple practices. These limits are applied generically. Less conservatism under the well defined circumstances associated with specific waste streams and disposal options envisaged in this NRC statement seems justified. In a proposed policy statement dated May 6, 1985,<sup>5</sup> the Canadian Atomic Energy Control Board specifically addressed disposal of specific wastes that are of no regulatory concern. An individual dose limit of 5 millirems per year was proposed for this limited application.

A maximum individual exposure of 1 millirem per year is also consistent with Appendix I to 10 CFR Part 50. Appendix I specifies design objective doses for operational light-water-cooled nuclear power reactor effluents. These design objectives include annual total body doses of 3 millirems for liquid effluents and 5 millirems for gaseous effluents. If onsite incineration at reactors is petitioned for as a specified disposal option, the petitioner should address how the proposed activity, combined with all other effluents from the sites, would not exceed the design objective doses in Appendix I to 10 CFR Part 50.

3. The collective doses to the critical population and general population are small.

*Discussion:* An additional advantage when individual doses are no more than 1 millirem per year is that the collective doses are then summations over very small exposures. The collective dose evaluation is primarily for information purposes, cost/benefit considerations, and to confirm the finding of no significant impact on the quality of the human environment. This determination will be made based on information available during the review of each petition in concert with criterion 5. Staff notes that the United Kingdom policy on individual dose limits includes an associated collective dose criterion. (The collective dose criterion must be met in addition to the individual limits).

In ICRP Publication 46, a similar criterion is stated.

4. The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant.

*Discussion:* Potential doses from accidents or intrusion should be well within public exposure limits and take into account the probability or possibility of such events. In a statement dated April 26, 1986,\* the International Commission on Radiological Protection (ICRP) stated that the ICRP's present view is that the principal dose limit for members of the public is 100 millirems in a year. The ICRP further stated that the 500 millirem limit from ICRP Publication 26 could be used as a subsidiary limit provided the lifetime average does not exceed the principal limit. Consequently, potential exposures from accidents or unexpected events would be more easily justified if they are well below 100 millirem per year principal limit.

5. The exemption will result in a significant reduction in societal costs.

*Discussion:* When the economic and exposure costs associated with the exemption are compared to disposal at a licensed low-level waste site there should be a significant reduction in costs.

6. The waste is compatible with the proposed treatment and disposal options.

*Discussion:* This criterion relates to the nonradiological properties of the wastes. For example, disposal of radioactive wastes that also qualify as a nonradiological hazardous material should be proposed for disposal methods in accord with EPA regulations (e.g., incineration or disposal at a hazardous waste facility). Also, wastes proposed for incineration should be combustible and wastes proposed for landfills should be appropriate for disposal in typical landfills anywhere in the nation.

7. The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category.

*Discussion:* Rulemaking is usually not warranted for wastes involving a single licensee, whether a continuing disposal activity or a one-time disposal. Such proposals by individual licensees are normally processed as licensing actions under 10 CFR 20.302(a).

8. The radiological properties of the waste stream have been characterized on a national basis, the variability has

been projected, and the range of variation will not invalidate supporting analyses.

*Discussion:* One of the merits of dealing with specific waste streams is that the actual properties of the waste stream can be relied upon in estimating impacts rather than conservative bounding parameters. The specific pathways that must be considered can be limited to manageable numbers. The expected fate can be credibly limited based on the properties.

9. The waste characterization is based on data on real wastes.

*Discussion:* Actual data on real waste provide reasonable assurance that the waste characterization is accurate.

10. The disposed form of the waste has negligible potential for recycle.

*Discussion:* Eliminating the uncertainties associated with recycle is necessary to expeditious handling. Specifying specific wastes and specific methods of disposal narrows the pathways and timeframes to manageable numbers.

11. Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance.

*Discussion:* Survey programs and quality control programs will be needed to provide reasonable assurance that actual wastes disposed of under an exemption rule meet the specified parameters. Since disposal would be exempted based on both established and projected waste characteristics, reporting on the wastes actually transferred for below regulatory concern disposal will be important and should be practical.

12. The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes.

*Discussion:* The evaluation of expected exposures should provide the basis for meeting this criterion. However, this is an area where NRC will have a continuing responsibility as multiple petitions are processed. Reporting on actual disposals will help NRC address this responsibility and monitor the adequacy of the limits included in the exempted disposals.

13. The methods and procedures used to manage the wastes and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials.

*Discussion:* Since the receiving facility will not be licensed for radioactive materials, special handling or measures should not be required at the processing or disposal sites because of the radioactive content of the wastes. This

criterion also means that realistic assumptions about the disposal methods have been made in estimating exposures.

14. There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods.

*Discussion:* To have practical use, the disposal option must be available. For example, if all hazardous waste facilities that accept offsite wastes are closed or are not reasonably distributed, the practicality of an exemption to allow disposal at such sites is questionable. Since the receiving facility will not be licensed for radioactive materials, shipments to landfills or hazardous waste facilities should not require identification as radioactive materials.

#### IV. Administrative Handling

Agency procedures for expeditious handling of petitions for rulemaking were initially published in 1982 in NUREG/BR-0053 "Regulations Handbook."<sup>1</sup> The procedures are contained in Part 11 of the Handbook and were most recently revised in September 1985. Because of resource limitations and other factors, these procedures have not been fully implemented. Petitions for rulemaking submitted in accordance with the Commission's policy statement and this staff implementation plan will be processed in full compliance with these procedures. These procedures coupled with agency policy to complete all rulemaking within 2 years will provide expeditious action on the petitions. In addition, the Handbook notes general scheduling advice that proposed rules to grant petitions should be published in 6-12 months after acceptance and publication for comment. Proposed rules will be forwarded to the Commission on a 6-month schedule to the extent permitted by resource limits, the nature and extent of public comments, and internal Control of Rulemakings procedures. Rulemakings involving power reactors must be reviewed by the Committee on Review of Generic Requirements prior to publication. Proposed rules involving reactors will therefore be forwarded to the Commission on a 7-month schedule to the extent permitted by resources, comments, and approval procedures. In both cases, every effort will be made to publish proposed rules no later than 12 months after noticing for public comment.

Although the procedures in Part 11 of NUREG/BR-0053 include fast track processing, the nature of the anticipated petitions do not fully comply with the decision criteria to follow this alternative.

Some of the key features of the handling procedures include the following steps for complete and fully supported petitions.

1. Petitioners may confer on procedural matters with the staff before filing a petition for rulemaking. Requests to confer on procedural matters should be addressed to: The Director, Division of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Chief, Rules and Procedures Branch.

2. Petitions should be addressed to: The Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. In keeping with 10 CFR 2.802(f), petitioners will be promptly informed if the petition meets the threshold requirements for a petition for rulemaking in 10 CFR 2.802(c) and can be processed in accordance with this implementation plan. Ordinarily this determination will be made within 30 days after receipt of the petition.

3. Following this determination, the petition will be noticed in the **Federal Register** for a public comment period of at least 60 days.

4. The petitioner will be provided copies of all comments received, scheduling information, and periodic status reports.

The procedures in NUREG/BR-0053 also include the process for denial and withdrawal of petitions.

# APPENDIX A

Commission Policy Statement  
on Radioactive Waste  
Below Regulatory Concern,  
Appendix B to 10 CFR Part 2  
(51 Fed. Reg. 30839)



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555


September 5, 1986

ATTENTION: Commission Licensees

SUBJECT: POLICY STATEMENT ON RADIOACTIVE WASTE BELOW REGULATORY CONCERN

A Commission policy statement concerning petitions for rulemaking to exempt specific radioactive waste streams from regulation was published in the Federal Register on August 29, 1986. A copy of the published policy statement and accompanying staff implementation plan is enclosed for your information. As a licensee, you may wish to encourage your trade or professional organizations to submit petitions following the guidance provided. You also may be contacted by such groups to help collect data or information to support petitions.

Any comments or suggestions you may have concerning the policy statement or implementation plan would be welcome.

  
Malcolm R. Knopp, Chief  
Low-Level Waste and Uranium Recovery  
Projects Branch  
Division of Waste Management

Enclosure:  
FR Notice dtd 8/29/86

The documents describe the kind of information petitioners should file to allow timely Commission review of the petition. They also describe decision criteria the Commission will use and the administrative procedures to be followed in order to permit the Commission to act upon the petition in an expedited manner. These documents respond to a mandate in the Low-Level Radioactive Waste Policy Amendments Act of 1985 and are being published as Appendix B to 10 CFR Part 2.

**EFFECTIVE DATE:** October 27, 1986.

**ADDRESSES:** Send any written comments or suggestions to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555; Attention: Docketing and Service Branch. Comments received within 60 days would be most helpful. Copies of comments received by the Commission may be examined or copied for a fee at the U.S. Nuclear Regulatory Commission (NRC) Public Document Room, 1717 H Street NW, Washington, DC 20555.

**FOR FURTHER INFORMATION CONTACT:** Kitty S. Dragonette, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone: (301) 427-4300.

**SUPPLEMENTARY INFORMATION:**

**List of Subjects in 10 CFR Part 2**

Administrative practice and procedure, Classified business information, Freedom of information, Hazardous waste, Nuclear material, Nuclear power plants and reactors, Penalties, Sex discrimination.

For the reasons set forth below and under the authority of the Atomic Energy Act of 1954 as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is adopting the following amendments to 10 CFR Part 2.

**PART 2—RULES OF PRACTICE FOR DOMESTIC LICENSING PROCEDURES**

1. The authority citation for Part 2 is revised to read as follows:

Authority: Secs. 161, 181, 68 Stat. 948, 953, as amended (42 U.S.C. 2201, 2231); sec. 191, as amended, Pub. L. 87-615, 78 Stat. 409 (42 U.S.C. 2241); sec. 201, 83 Stat. 1242, as amended (42 U.S.C. 5841); 5 U.S.C. 552.

Section 2.101 also issued under secs. 53, 62, 63, 61, 103, 104, 105, 68 Stat. 930, 932, 933, 935, 936, 937, 938, as amended (42 U.S.C. 2073, 2092, 2093, 2111, 2133, 2134, 2135); sec. 102, Pub. L. 91-190, 83 Stat. 653, as amended (42 U.S.C. 4332); sec. 301, 88 Stat. 1248 (42 U.S.C. 5871). Sections 2.102, 2.103, 2.104, 2.105, 2.721 also issued under secs. 102, 103, 104, 105, 183, 189, 68 Stat. 936, 937, 938, 954, 955, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2233, 2239). Section 2.105 also issued under

Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Sections 2.200-2.206 also issued under secs. 186, 234, 68 Stat. 955, 83 Stat. 444, as amended (42 U.S.C. 2236, 2282); sec. 206, 88 Stat. 1248 (42 U.S.C. 5846). Sections 2.600-2.606 also issued under sec. 102, Pub. L. 91-190, 83 Stat. 653, as amended (42 U.S.C. 4332). Sections 2.700a, 2.719 also issued under 5 U.S.C. 554. Sections 2.754, 2.760, 2.770 also issued under 5 U.S.C. 557. Section 2.790 also issued under sec. 103, 68 Stat. 936, as amended (42 U.S.C. 2133) and 5 U.S.C. 552. Sections 2.800 and 2.805 also issued under 5 U.S.C. 553. Section 2.809 also issued under 5 U.S.C. 553 and sec. 29, Pub. L. 85-256, 71 Stat. 579, as amended (42 U.S.C. 2039). Subpart K also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2239); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154). Appendix A also issued under sec. 8, Pub. L. 91-580, 84 Stat. 1437 (42 U.S.C. 2135). Appendix B is also issued under sec. 10, Pub. L. 99-240, 99 Stat. 1842 (42 U.S.C. 2021b et seq.).

2. Add the following policy statement as Appendix B to Part 2:

Appendix B to Part 2—General Statement of Policy and Procedures Concerning Petitions Pursuant to § 2.802 for Disposal of Radioactive Waste Streams Below Regulatory Concern:

- I. Introduction and Purpose
- II. Standards and Procedures
- III. Agreement States
- IV. Future Action

**I. Introduction and Purpose**

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (the Act) (42 U.S.C. 2021b et seq.) was enacted January 15, 1986. Section 10 of the Act addresses disposal of wastes termed "below regulatory concern" that would not need to be subject to regulatory control to assure adequate protection of the public health and safety because of their radioactive content. The goal of this section of the Act is for the Commission to make practical and timely decisions to determine when wastes need not go to a licensed low-level waste disposal site. These decisions will be expressed through rulemaking. Alternative disposal would conserve space in the existing sites while new sites are established and reduce the costs of disposal. Rulemaking petitions may play a role in the national low-level waste strategy outlined by the Act. The Act provides that the Commission establish procedures for acting expeditiously on petitions to exempt specific radioactive waste streams from the Commission's regulations.

The purpose of this statement and accompanying implementation plan is to establish the standards and procedures that will permit the Commission to act upon rulemaking petitions in an expeditious manner as called for in the Act. This policy statement does not require petitioners to present all the information outlined or demonstrate that the decision criteria for expedited handling can be met, if such expedited handling is not wanted. For example, petitions requesting exemption of concentrations of radionuclides that might

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 2**

**Radioactive Waste Below Regulatory Concern; Policy Statement**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Final rule; policy statement.

**SUMMARY:** This notice contains a policy statement and staff implementation plan regarding expeditious handling of petitions for rulemaking to exempt specific radioactive waste streams from disposal in a licensed low-level waste disposal facility. For the Nuclear Regulatory Commission (NRC) to grant these rulemaking petitions, the waste streams must be sufficiently low in concentration or quantities of radionuclides for the Commission to find that they may be disposed of by alternative means without posing an undue risk to public health and safety. The policy statement and plan are in the nature of regulatory guidance for implementing existing requirements for rulemaking petitions in 10 CFR 2.802.



result in individual exposures higher than those recommended in the decision criteria may be submitted, but expedited handling cannot be assured.

Finally, this policy statement and accompanying implementation plan are intended to facilities handling of rulemaking petitions for streams from multiple producers and do not apply to individual licensing actions on single producer waste. Individual licensees who seek approval for disposal of their unique wastes may continue to submit their disposal plans under 10 CFR 20.302(a).

## II. Standards and Procedures

The standards and procedures needed to handle petitions expeditiously fall into the following three categories: (1) Information petitioners should file in support of the petitions, (2) standards for assessing the adequacy of the proposals and providing petitioners insight on the decision criteria the Commission intends to use so that all relevant informational issues will be addressed in the petition, and (3) the internal NRC administrative procedures for handling the petitions. These three categories are addressed in the attached staff implementation plan. The staff plan was developed in response to Commission direction to provide detailed guidance on implementing the general approach outlined in this policy statement. Although staff may revise it from time to time as experience is gained in processing petitions, the plan outlines a reasonable basis for accomplishing the approach. Staff is to publish revisions as NUREG documents and notice the availability of the revisions in the **Federal Register**.

As a practical matter, the primary information for justifying and supporting petitions must be supplied by the petitioner if the Commission is to act in an expedited manner. If the petitioner wishes to assure expedited action, the supporting information should be complete enough so that Commission action is primarily limited to independent evaluation and administrative processing.

Decision criteria for judging whether to grant a petition involve the overall impacts of the proposed action, waste properties, and implementation of the proposed exemption. The following criteria address these areas. Petitions which demonstrate that these criteria are met should be suitable for expedited action.

1. Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment.

2. The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events.

3. The collective doses to the critical population and general population are small.

4. The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant.

5. The exemption will result in a significant reduction in societal costs.

6. The waste is compatible with the proposed treatment and disposal options.

7. The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category.

8. The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses.

9. The waste characterization is based on data on real wastes.

10. The disposed form of the waste has negligible potential for recycle.

11. Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance.

12. The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes.

13. The methods and procedures used to manage the wastes and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials.

14. There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods.

## III. Agreement States

The Low-Level Radioactive Waste Policy Amendments Act of 1985 establishes a national system for dealing with low-level waste disposal. The system assigns to the States responsibility for disposal capacity for low-level wastes not exceeding Class C wastes as defined in 10 CFR 61.55. Section 10 of the Act encourages a reduction in volume of such wastes subject to State responsibility for disposal through the option of determining that certain wastes need not go to existing licensed disposal facilities or new sites licensed under 10 CFR Part 61 or equivalent State regulations. If radiological safety can be assured, such disposal would conserve space in the existing sites while new sites are developed, and would serve as an important adjunct to volume reduction efforts in meeting the waste volume allocation limits set forth in the Act. Thus, these rulemakings should aid the States in fulfilling their responsibilities under the Act. Equity also suggests that all waste generators be able to take advantage of below regulatory concern options as part of their waste management strategies. Generators in both Agreement and non-Agreement States will be competing for space in the existing sites and the concept should be applicable nationwide.

Agreement States will play an important role in ensuring that the system works on a national basis and that it remains equitable. States have been encouraging findings that certain wastes are below regulatory concern and do not have to go to low-level waste sites. The States have been voicing this view for a number of years through forums such as the Conference of Radiation Control Program Directors. Rulemakings granting petitions will be made a matter of compatibility for Agreement States. Consequently, rulemaking will be coordinated with the States.

## IV. Future Action

The Commission will conduct a generic rulemaking on waste streams below regulatory concern based on a number of factors. The factors include public comments received on the statement, the number and types of petitions for rulemaking received, and how effective the statement is in enabling timely processing of petitions. A generic rulemaking is warranted to provide a more efficient and effective means of accomplishing the goals reflected in Section 10 of the Act. An advance notice of proposed rulemaking will be published within 90 days. Furthermore, the Commission may periodically review all rulemakings in order to assure that the relevant parameters have not changed significantly and may ask the petitioner to submit updated information to assist in the review. The Commission would also have to confirm that approved exemptions are consistent with any general standards issued by EPA.

Dated at Washington, DC this 25th day of August, 1986.

For the Nuclear Regulatory Commission,

Samuel J. Chilk,

Secretary to the Commission.

Editorial Note: The staff implementation plan will not appear in the Code of Federal Regulation.

## Nuclear Regulatory Commission Staff Implementation of Nuclear Regulatory Commission Policy on Radioactive Waste Below Regulatory Concern

- I. Introduction
- II. Information to Support Petitions
  - A. General
    1. 10 CFR Part 2 Requirements
    2. Environmental Impacts
    3. Economic Impact on Small Entities
    4. Computer Program
    5. Scope
  - B. Waste Characterization
    1. Radiological Properties
    2. Other Considerations
    3. Totals
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    5. As Low as Reasonably Achievable (ALARA)
  - C. Waste Management Options
  - D. Analyses
    1. Radiological Impacts
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    1. Surveys
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  - F. Proposed Rule
- III. Decision Criteria
- IV. Administrative Handling

### I. Introduction

Section 10 of the Low-Level Radioactive Waste Policy Amendments Act of 1985 requires the Nuclear Regulatory Commission (NRC) to develop standards and procedures for expeditious handling of petitions for rulemaking to exempt disposal of radioactive waste determined to be

below regulatory concern. The Act also requires NRC to identify information petitioners should file. The Commission Policy Statement provides general guidance on how to meet the requirements of section 10 of the Act, outlines the overall approach to be followed, and lists decision criteria to be used. Implementation of the general approach and decision criteria of the Commission Policy Statement involves developing more detailed guidance and procedures. In accordance with Commission direction, the NRC staff has developed more detailed guidance and procedures for implementation of the Commission Policy Statement. This staff guidance and procedures cover: (1) information petitioners should file in support of petitions to enable expedited processing, (2) discussion of the decision criteria, and (3) administrative procedures to be followed.

## II. Information to Support Petitions

### A. General

1. *10 CFR Part 2 requirements.* The codified information requirements for petitions for rulemaking are outlined in the Commission's regulations in 10 CFR 2.802(c). These regulations require the petitioner to identify the problem and propose solutions, to state the petitioner's grounds for and interest in the action, and to provide supporting information and rationale. As a practical matter, the information demonstrating that the radiological health and safety impacts are so low as to be below regulatory concern must be provided by the petitioner if the Commission is to act in an expedited manner. Petitions for rulemaking should therefore be submitted following the staff's supplemental guidance and procedures to assure expedited action.

2. *Environmental impacts.* Petitions must enable the Commission to make a finding of no significant impact on the quality of the human environment. Such Commission findings must be based on an Environmental Assessment that complies with 10 CFR 51.30 and must meet the requirements of 10 CFR 51.32. These requirements include addressing the need for the proposed action, identifying alternatives, and assessing the potential environmental impacts of the proposed action and alternatives. Consistent with 10 CFR 51.41, the petitioner should submit the information needed to meet these requirements and do so in a manner that permits independent evaluation by the Commission of the data and methodology used and the conclusions reached.

3. *Economic impact on small entities.*

When a rulemaking action is likely to have a significant economic impact on a substantial number of small entities, the Regulatory Flexibility Act requires that the impacts on these small entities must be specifically addressed. (The Commission's size standard for identifying a small entity is \$3.5 million or less in annual receipts except for private practice physicians and educational institutions where the standard is \$1 million or less in annual receipts for private practice physicians and 500 employees for educational institutions. See 50 FR 50214, December 9, 1985.) For any rulemaking, the Commission must either certify that the rule will not economically impact or will have no significant economic impacts on small entities, or present an analysis of alternatives to minimize the impacts. Because rulemakings on below regulatory concern should provide relief from requirements for all affected entities, satisfaction of this requirement should be straightforward but it must be addressed in any rulemaking. To facilitate expeditious preparation of the proposed rule responding to the petition, the petitioner should submit an evaluation of the estimated economic impacts on small entities. The evaluation should include estimates of the costs for small entities in terms of staff time and dollar costs. Any alternatives that could accomplish the objective of the petitioner's proposed rule while minimizing the economic impact on small entities should be presented. The evaluation should include an assessment of the incremental recordkeeping and reporting costs that would be associated with the petitioned rule change.

4. *Computer program.* The computer program (IMPACT-BRC) the Commission intends to use to independently evaluate petitioners' assessments of impacts is based on "De Minimis Waste Impacts Analysis Methodology" (NUREG/CR-3585) published February 1984.<sup>1</sup> Petitioners are encouraged to consult NUREG/CR-3585 in order to better understand the Commission's information needs. The IMPACTS-BRC program will be distributed by the National Energy Software Center on floppy diskettes for use on IBM-PC and compatible computers. The Center's address is 9700 South Cass Avenue, Argonne National Laboratory, Argonne, Illinois 60439. The users guide for IMPACTS-BRC will be published as a draft Volume II of NUREG/CR-3585. Petitioners may evaluate the impacts of the proposed activity using NRC's code, if desired.

<sup>1</sup>Footnotes at end of article.

When alternate calculational methodologies are used, the petitioner should provide all the specific input needed to analyze the waste stream in the petition using IMPACTS-BRC and provide a rationale for all parameter selection. The Commission may clarify or modify the computer code from time to time. Petitioners choosing to use NRC's code should be sure to use the current revision. The National Energy Software Center will provide changes to persons obtaining the program from the Center. Users are encouraged to comment on the code so that their experience can be factored into future revisions.

5. *Scope.* The petitioner should define the geographic area to which the proposed rule should apply and the reasons supporting any area less than national in scope. It might be possible to justify limiting the scope to a low-level waste regional compact or a state but implementation issues such as import or export of wastes outside the compact or state should be addressed in the rationale.

### B. Waste Characterization

1. *Radiological properties.* The minimum radiological properties that should be described are the concentration or contamination levels and the half-lives, total quantity, and identities of the radionuclides present. The chemical and physical form of the radionuclides should be addressed. All radionuclides present or potentially present should be specified, including radionuclides identified as trace constituents. The distribution of the radionuclides within the wastes should be noted (e.g., surface or volume distribution). Mass and volume average concentrations should also be presented. For incineration, the radioactive content of the ash and noncombustible fraction should be described. The variability as a function of process variation and variation among licensees should be addressed and bounded.

2. *Other considerations.* An understanding of nonradiological properties of the waste stream is needed to assure that they are consistent with the proposed disposal method and to evaluate the adequacy of the analysis of the radiological impacts. (NRC's deregulation of the radioactive content would not relieve licensees from the applicable rules of other agencies which cover the nonradiological properties.) The petitioner should provide a detailed description of the waste materials, including their origin, chemical

composition, physical state, volume, and mass.

The term "stream" only means wastes produced from a common set of circumstances and possessing common characteristics. It does not mean "liquid" although the stream may be in a liquid form (e.g., waste oil). The wastes may be resin beads, laboratory glassware, or any other form. Waste form includes packages or containers used to manage (i.e., store, handle, ship, or dispose) the wastes. The variability and potential changes in the waste form as a function of process variation should be addressed. The variation among licensees should be described and bounded.

Compatibility with requirements associated with the proposed management options should be carefully presented. For example, if the petitioner proposes that the wastes be incinerated, the waste form should be shown to be compatible with the temperatures, flow rates, feed rates, and other operating parameters of typical incinerators that may be used. The petitioner should identify the minimum requirements an incinerator must meet to assure adequate combustion. The form and volume of the ash and other residue from incineration should be described. Similar consideration for disposal at sanitary landfills or hazardous waste sites should be addressed. For example, wastes that include components or properties that would qualify the waste as a "hazardous waste" under EPA rules in 40 CFR Parts 260 through 265 should not be proposed for disposal at a municipal landfill.

The potential for recycle should be presented. Possible treatment, such as shredding, would reduce the recycle potential should be described. Both the resource value (e.g., salvageable metals) and the functional usefulness (e.g., usable tools) should be addressed. Both short- and long-term potentials for recycle are of significant concern to the Commission.

3. *Totals.* A subsequent rulemaking based upon an accepted petition is generic, and the exemption will likely be used nationwide. Therefore, to the extent possible, the petitioner should estimate the number of NRC and Agreement State licensees that produce the waste, the annual volumes and mass, and the total annual quantities of each radionuclide that would be disposed of. The estimates should include the current situation and the likely variability over the reasonably foreseeable future. If the petition is for a proposed rule that will be limited to less than national scope (e.g., a state or compact region), the totals should be

estimated for the petitioned scope. A concentration distribution would be a helpful tool in characterizing the waste stream. For example, the petitioner could indicate that 10% of the wastes fall in the range of 1-10 picocuries per gram, 60% fall in the 10-100 range, and 30% in the 100-1,000 range. Such distribution would permit more realistic assessment of impacts in addition to conservative bounding estimates using maximum values. In any case, the typical quantities produced per generator and an estimate of the geographic distribution of the generators should be described.

4. *Basis.* The basis for the waste stream characterization should be provided. The basis for characterization of the wastes and the total quantities produced should be described. Monitoring, analytical data, and calculations should be specified. Actual measurements or values that can be related to measurements to confirm calculations are important. The description of the bases should include quality assurance aspects. For example, the petitioner should describe the number of samples measured, the representativeness of the samples, and the appropriateness of the instruments used. The statistical confidence in the estimates should be evaluated. If the petitioner conducted any surveys of licensees or relied on surveys by others to help quantify the amount and content of wastes, they should be described. Market information might be useful in characterizing waste generation on a national basis. Designation as a "trace concentration" should be related to specified detection limits, but detection limits themselves are not sufficient reason to dismiss trace concentrations when methods exist to infer concentrations.

For estimates of the radionuclide content of the waste stream, the petitioner may take advantage of licensee experience in classifying wastes for disposal at low-level waste sites. For example, the transuranic radionuclide content of the wastes would likely be below detection limits, but licensees have already established scaling factors for estimating the transuranic content of wastes as part of complying with 10 CFR Part 61 waste classification requirements. Waste generators use generic scaling factors and factors established for their specific wastes through sophisticated analyses. The scaling factors are used to infer the presence and concentrations of many radionuclides based on measurement of only a few nuclides. The classification scheme in 10 CFR Part 61 has been in effect since December 1983.

Considerable data and experience should be available to allow characterizing the radiological content and composition of the waste stream being addressed in the petition. The same principles outlined in 10 CFR 61.55(a)(8) may be applied, i.e., values based on direct measurements, indirect methods related to measurements, or material accountability.

5. *As low as is reasonably achievable (ALARA).* The Commission's ALARA requirement in 10 CFR 20.1(c) applies to efforts by licensees to maintain radiation exposures and releases of radioactive materials in effluents to unrestricted areas as low as is reasonably achievable. 10 CFR Part 50, Appendix I, describes ALARA for radioactive materials in light water reactor effluents. Licensee compliance with 10 CFR 20.1(c) is a precondition to acceptance by NRC of any waste stream as exempt. Therefore, a description should be provided of reasonable procedures that waste generators would be expected to use to minimize radiation exposures resulting from the disposal of the exempt waste, e.g., removal of surface contamination. These procedures are assumed to apply prior to characterizing the waste to be exempted.

#### C. Waste Management Options

The management options that the Commission can deal with expeditiously are those described in NUREG/CR-3585. Onsite options include incineration and burial. Offsite options are municipal waste disposal facilities (sanitary landfills), municipal waste incinerators, hazardous disposal facilities, and hazardous waste incinerators. Pretreatment, e.g., shredding of otherwise potentially recyclable materials, is a potential adjunct to either onsite or offsite options. Combinations of these options can also be evaluated. For example, wastes may be incinerated on site and the ash shipped to a sanitary landfill. The favored disposal options should be identified and fully described. The petitioner should evaluate a full range of options. The practicality of the proposed option(s) should be presented. Waste compatibility discussed earlier is one aspect. The national availability and distribution of the option is another. Updates on national regulations and laws pertaining to the proposed option should be described and might have to be considered in selecting acceptable options.

#### D. Analyses

To support and justify the submittal, each petitioner should include analyses of the radiological impacts associated

with handling, transport, and disposal of the specific wastes. Any incremental nonradiological impacts should be assessed. Also the petitioner should use the analyses to prepare and submit a detailed regulatory analysis with the petition.

1. *Radiological impacts.* The evaluation of radiological impacts should distinguish between expected and potential exposures and events. Impacts should be assessed for the expected concentrations and quantities of radionuclides. The petitioner should quantitatively evaluate the impacts from the proposed waste for each option requested. The petitioner should clearly relate the analytical findings to specific provisions in the recommended rule changes. For example, the basis for each recommended radionuclide limit should be clearly explained.

The radiological impacts included in NUREG/CR-3585 and in NRC's computer program (IMPACTS-BRC) cover exposures to workers and individual members of the public and cumulative population exposures. The program calculates both external direct gamma exposures and exposures from ingested or inhaled radionuclides. NRC's computer program can be used to calculate the expected radiological impacts from generator activities, transportation, treatment, disposal operations, and post-disposal inputs. The program can analyze a wide range of management options including onsite treatment and disposal by the generator, shipment to municipal waste management facilities, and shipment to hazardous waste management facilities. The program covers impacts beginning with initial handling and treatment by the generator through final disposal of all the radionuclides contained in the waste stream. Sequential treatment, sorting, and incineration onsite and at municipal and hazardous facilities can be assessed. Disposal of resulting ash and residue is included. Post-disposal impacts that can be calculated include releases due to intrusion, ground-water migration, erosion, and leachate accumulation. The program thus addresses both expected and potential post-disposal impacts.

The petitioner's analysis of transport impacts should be based on a reasonably expected spatial distribution of licensees and waste treatment and disposal facilities which will accept the wastes. The petitioner should address parameters such as average and extreme transport distances. The petitioner's analysis should address the basis for parameter selection and characterize the expected patterns (e.g.,

indicate how likely the extreme case may be). In addition, the petitioner's analysis should also address potential exposures from handling and transport accidents. The petitioner's analysis of accidents should include all assumptions, data, and results to facilitate review. The potential for shipment of the entire waste stream to one or a few facilities should be assessed. This scenario currently exists for 10 CFR 20.306 exempted liquid scintillation wastes and might result from very limited numbers of treatment facilities or decontamination services. The analysis of impacts for transport, handling, and disposal should include evaluation of this potential circumstance unless it can be clearly ruled out.

As suggested in Paragraph 89 on page 20 of ICRP Publication 46<sup>2</sup>:

Exception from regulation and requirements on these bases should not be used to make it possible to dispose of large quantities of radioactive material in diluted form, or in divided portions, causing widespread pollution which would eventually build up high dose levels by the addition of many small doses to individuals. They should be used to exempt activities that, by isolation or treatment, have been made temporarily harmless but that imply large potential for release and could give rise to high individual doses or high collective doses.

The analysis of expected radiological impacts should clearly address:

- The maximum individual exposures.
- The critical group exposures
- The cumulative population exposures.

The maximum individual exposure evaluation should include exposures to all members of the public who may be exposed beginning with the initial handling at the generator's facility through post-closure. Both internal uptake and external exposures should be included. The individual may be a member of the general population (e.g., consumer of contaminated ground water) or a person receiving the exposure from his or her occupation. Anyone who may be exposed and is not a radiation worker should be considered a member of the public. For example, a worker at a sanitary landfill or a commercial trash truck driver would not be a radiation worker. However, occupational exposures to radiation workers should be evaluated and considered in the cost/benefit analysis of the incremental impacts between disposal at a licensed facility and the requested disposal options.

The total population exposures can be estimated and summed in two parts. One part is the smaller critical group (usually the occupationally exposed population) where potential exposures

may be higher on an individual basis but the exposures and the number of exposed individuals are more predictable and the exposures are short-term. The critical group should be the segment of the population most highly exposed exclusive of radiation workers. The other part is the general population where the expected exposures and size of the exposed population are less predictable, potential individual exposures are probably much smaller, and exposures may extend over longer timeframes. Presentation of the population exposures in these two parts should contribute to a more meaningful cost/benefit analysis.

2. *Other impacts.* The NRC action to exempt the radiological content of the wastes would not relieve persons handling, processing, or disposing of the wastes from requirements applicable to the nonradiological properties. The petition should demonstrate that the nonradiological properties of the radioactive waste are the same as the nonradioactive materials normally handled and disposed of by the proposed methods. If the nonradiological properties are similar and the volumes of exempted waste would not impact the normal operations, there should be no incremental impacts. If the petitioner is aware of other impacts which should be considered for the specific wastes in the petition, the petitioner should also address the additional impacts.

3. *Regulatory analysis.* In order to expedite subsequent rulemaking if the petition is granted, the analysis should also address the topics NRC must address in a Regulatory Analysis (e.g., see NUREG/BR-0058, Revision 1, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission").<sup>1</sup> Following the Regulatory Analysis format will structure the analytical findings, present the bases for decisions, and address the environmental assessment requirements. The topics are:

(1) *A statement of the problem.* This topic is the need for determining which wastes may be safely disposed of by means other than shipment to licensed low-level waste sites.

(2) *Alternatives.* All reasonable alternatives to the proposed action should be described. The no action or status quo alternative should always be included.

(3) *Consequences.* This topic calls for an analysis of the impacts of each alternative described. The factors the petitioner should address include costs and benefits and practical or legal constraints. Cost/benefit considerations

and constraints are discussed more fully after this listing of topics.

(4) *Decision rationale.* This topic is a conclusions statement that explains why the preferred alternative(s) should be adopted.

(5) *Implementation.* This topic covers the steps and schedules for actual implementation of the proposed rule. The petitioner should address the topic from the waste generator's perspective and include surveys discussed under Topic III.A.5. Recordkeeping and Reporting.

A cost/benefit discussion is an essential part of both environmental and regulatory impact considerations and is, therefore, essential to expedited handling. The discussion should focus on expected exposures and realistic concentrations or quantities of radionuclides. The cost/benefit discussion should include the differential exposure and economic costs between disposal at a licensed low-level waste disposal site and the proposed option(s). It may also include qualitative benefits. Reduced hazards from not storing hazardous or combustible materials might be a benefit. Elimination or reduction of the hazardous properties (e.g., by incineration) could be another. Detrimental costs might also be qualitative such as loss of space in municipal or hazardous waste sites. The economic impact on the licensed site operations (i.e., loss of income from diverted wastes) and its potential effect on the availability of economic and safe disposal should be addressed. Costs of surveys and verifying compliance discussed under Topic II.E.

Recordkeeping and Reporting should also be covered. The cost/benefit should also reflect ALARA considerations. Radiation worker exposure, public exposure, and environmental releases might be appropriate in ALARA considerations. In weighing the exposure costs and economic costs for light-water-cooled nuclear reactor wastes, the petitioner could use, for perspective, the \$1,000 per person-rem guideline in 10 CFR Part 20, Appendix I, for effluent releases from these facilities.

The petitioner should identify any legal or regulatory constraints that might impact implementation of the petitioned change. The compatibility of the waste with the proposed method of disposal was discussed under Topic II.B.2. Other constraints might stem from Department of Transportation (DOT) labeling, placarding, and manifesting requirements for radioactive materials. Since the receiving facility will not be licensed to receive radioactive materials, this could be an impediment

to implementation. For most radioactive materials, the general DOT threshold limits of 0.002 microcuries per gram apply. However, the DOT issued a final rule on June 6, 1985 (50 FR 23811) that amended 49 CFR Part 173 to exempt low specific activity wastes as described in NRC's rules in 10 CFR 20.306. (Note that DOT emphasized that the wastes remain subject to the provisions related to other hazards; see 49 CFR 173.425(d).)

#### E. Recordkeeping and Reporting.

1. *Surveys.* Existing regulations in § 10 CFR 20.201 establish general NRC requirements for performing surveys as necessary to comply with Part 20. Licensees would have to conduct surveys of the waste properties prior to release for exempt disposal to verify that the waste meets the prescribed limits. Such survey programs might consist of (1) fairly comprehensive initial sampling and analysis to confirm that the licensee's wastes will fall below the limits, (2) periodic analysis as part of a process or quality control program to confirm the initial findings, and (3) a routine survey program prior to release of wastes to monitor for gross irregularities. To show that licensees can be expected to conduct compliance surveys prior to waste transfer, the petitioner should describe a sample survey program. The three components just discussed should be included, if appropriate, for the waste stream. Records of the surveys would be maintained for inspection.

2. *Reports.* The petitioner should assume that annual reports on disposals will be required and that associated recordkeeping to generate the reports will be imposed. Minimum information in the annual reports initially might include the type of waste, its volume, its estimated curie content, and the place and manner of disposal. Increased recordkeeping and reporting requirements would address uncertainties in projecting future volumes or amounts of wastes and NRC's responsibility to consider the cumulative impacts of multiple exemptions. When these requirements are proposed, Office of Management and Budget (OMB) approval is required. To facilitate NRC filing for OMB approval, the petitioner should include any duplicating or overlapping reporting requirements, the number and type of expected respondents, suggestions for minimizing the burden, estimates of the staff hours and costs to prepare the reports and keep the records, and a brief description of the basis for the estimates. The petitioner should also

address whether changes in technical specifications or licenses may be needed.

#### F. Proposed Rule

The petition should include the text for the proposed rule (see 10 CFR 2.802(c)(1)). The proposed text should cover at least the following:

(1) The quantity and/or concentration limit for each radionuclide present (trace radionuclides could be lumped together with a total limit);

(2) A method to deal with radionuclide mixtures;

(3) The nonradiological specifications necessary to adequately define the waste; and

(4) The specific method(s) of exempt disposal.

If practicable, and if the supporting information indicates the need, the text should also address other features such as annual limits on each generator in terms of volume, mass, or total radioactivity, and administrative or procedural requirements including process controls, surveys, etc., that have been discussed. The text should not include the various dose limits used to justify the proposed radionuclide limits.

#### III. Decision Criteria

The Commission policy statement establishes that the following criteria should be used by staff as guidelines for acting on a petition. Each criterion is repeated and staff views on implementation are discussed.

1. Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment.

*Discussion:* Unless this finding can be made during information submitted by the petitioner, the Commission must prepare an Environmental Impact Statement to more fully examine the proposed action, alternatives to the proposed action, and associated potential impacts of alternatives. Preparation would likely involve contractual support and would likely take 2 years or more to complete. The Commission could not act in the petition in an expedited manner.

2. The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events.

*Discussion:* The effective dose equivalent means the ICRP Publication 26 and 30<sup>3</sup> sum of the dose from

external exposure and the dose incurred from that year's intake of radionuclides. While a range of 1-10 millirem per year might be acceptable, a one millirem dose would facilitate expedited processing. Higher doses may require more extensive justification. Based on a mortality risk coefficient for induced cancer and hereditary effects of  $2 \times 10^{-4}$  per rem (ICRP Publication 26), radiation exposure at a level of millirem per year would result in an annual mortality risk of  $2 \times 10^{-7}$  (i.e.,  $2 \times 10^{-4}$  effects/rem $\times 10^{-3}$  rem/year).

The EPA is developing criteria for identifying low-level radioactive waste that may be below regulatory concern as part of that agency's development of general environmental standards for low-level waste disposal. The EPA published an Advance Notice of Proposed Rulemaking on August 31, 1983 (46 FR 39563) and currently hopes to publish proposed standards in early 1987. Other EPA standards that the doses can be compared to are the Clean Air Act radioactive release standard of 25 millirems per year in 40 CFR Part 61 and the uranium fuel cycle annual whole body limit of 25 millirems in 40 CFR 160.

One millirem is very small when compared to naturally occurring background doses from cosmic and terrestrial sources. Background doses in the United States are typically in the 100-120 millirems per year range exclusive of the lung doses from radon. One millirem is also small when compared to the annual 500 millirem dose limit for individual members of the general public in Federal Radiation Council guidance.

An important feature is that doses of up to 1 millirem from the individual petition should minimize concerns over exposure to multiple exempted waste streams. ICRP Publication 46 addressed individual dose limits and other issues related to exemptions and stated, in paragraphs 83 and 84 on page 19:

Many radiation exposures routinely encountered in radiation protection, particularly those received by members of the public, are very small by comparison with dose limits or natural background, and are well below dose levels at which the appearance of deleterious health effects has been demonstrated. In individual-related assessments, it is widely recognized that there are radiation doses that are so small that they involve risks that would be regarded as negligible by the exposed individuals. Studies of comparative risks experienced by the population in various activities appear to indicate that an annual probability of death of the order of  $10^{-4}$  per year or less is not taken into account by individuals in their decisions as to actions that could influence their risks. Using rounded dose response factors for induced

health effects, this level of risk corresponds to an annual dose of the order of 0.1 mSv (10 millirem).

However, in most practical cases, the need for exemption rules arises in source-related assessment, to decide whether a source or waste stream should be subject to control. Consideration should be given to the need for any optimization of radiation protection and to the possibility that many practices and sources of the same kind could combine now or in the future so that their total effect may be significant, even though each source causes an annual individual dose equivalent below 0.1 mSv (10 millirem) to individuals in the critical group. This may involve assessments of dose commitments and of the collective dose per unit practice or source, in order to ensure that the individual dose requirement will not be exceeded now or in the future. It seems almost certain that the total annual dose to a single individual from exempted sources will be less than ten times the contribution from the exempted source giving the highest individual dose. This aspect could, therefore, be allowed for by reducing the annual individual dose exemption criterion from 0.1 to 0.01 mSv (10 to 1 millirem).

The NRC staff recognizes that at times, human reactions are not so strictly governed by quantitative considerations as the ICRP excerpt suggests. Nevertheless, the  $10^{-4}$  per year value seems about as low as practicable, seems too low to justify significant concern, and so seems acceptable.

The United Kingdom's National Radiological Protection Board has issued generic guidance on de minimis dose levels (ASP-7, January 1985)<sup>4</sup> that has status similar to Federal Radiation Guidance issued by the President in this country. The Board identified effective dose equivalents of 5 millirem per year as insignificant when members of the public make their decisions. The 5 millirem limit represents the total dose contribution from all exempted practices. For individual practices, the Board divided by 10 (i.e., 0.5 millirem per year) to account for exposures from multiple practices. These limits are applied generically. Less conservatism under the well defined circumstances associated with specific waste streams and disposal options envisaged in this NRC statement seems justified. In a proposed policy statement dated May 6, 1985,<sup>5</sup> the Canadian Atomic Energy Control Board specifically addressed disposal of specific wastes that are of no regulatory concern. An individual dose limit of 5 millirems per year was proposed for this limited application.

A maximum individual exposure of 1 millirem per year is also consistent with Appendix I to 10 CFR Part 50. Appendix I specifies design objective doses for operational light-water-cooled nuclear power reactor effluents. These design

objectives include annual total body doses of 3 millirems for liquid effluents and 5 millirems for gaseous effluents. If onsite incineration at reactors is petitioned for as a specified disposal option, the petitioner should address how the proposed activity, combined with all other effluents from the sites, would not exceed the design objective doses in Appendix I to 10 CFR Part 50.

3. The collective doses to the critical population and general population are small.

*Discussion:* An additional advantage when individual doses are no more than 1 millirem per year is that the collective doses are then summations over very small exposures. The collective dose evaluation is primarily for information purposes, cost/benefit considerations, and to confirm the finding of no significant impact on the quality of the human environment. This determination will be made based on information available during the review of each petition in concert with criterion 5. Staff notes that the United Kingdom policy on individual dose limits includes an associated collective dose criterion. (The collective dose criterion must be met in addition to the individual limits). In ICRP Publication 46, a similar criterion is stated.

4. The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant.

*Discussion:* Potential doses from accidents or intrusion should be well within public exposure limits and take into account the probability or possibility of such events. In a statement dated April 26, 1986,<sup>6</sup> the International Commission on Radiological Protection (ICRP) stated that the ICRP's present view is that the principal dose limit for members of the public is 100 millirems in a year. The ICRP further stated that the 500 millirem limit from ICRP Publication 26 could be used as a subsidiary limit provided the lifetime average does not exceed the principal limit. Consequently, potential exposures from accidents or unexpected events would be more easily justified if they are well below 100 millirem per year principal limit.

5. The exemption will result in a significant reduction in societal costs.

*Discussion:* When the economic and exposure costs associated with the exemption are compared to disposal at a licensed low-level waste site there should be a significant reduction in costs.

6. The waste is compatible with the proposed treatment and disposal options.

*Discussion:* This criterion relates to the nonradiological properties of the wastes. For example, disposal of radioactive wastes that also qualify as a nonradiological hazardous material should be proposed for disposal methods in accord with EPA regulations (e.g., incineration or disposal at a hazardous waste facility). Also, wastes proposed for incineration should be combustible and wastes proposed for landfills should be appropriate for disposal in typical landfills anywhere in the nation.

7. The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category.

*Discussion:* Rulemaking is usually not warranted for wastes involving a single licensee, whether a continuing disposal activity or a one-time disposal. Such proposals by individual licensees are normally processed as licensing actions under 10 CFR 20.302(a).

8. The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses.

*Discussion:* One of the merits of dealing with specific waste streams is that the actual properties of the waste stream can be relied upon in estimating impacts rather than conservative bounding parameters. The specific pathways that must be considered can be limited to manageable numbers. The expected fate can be credibly limited based on the properties.

9. The waste characterization is based on data on real wastes.

*Discussion:* Actual data on real waste provide reasonable assurance that the waste characterization is accurate.

10. The disposed form of the waste has negligible potential for recycle.

*Discussion:* Eliminating the uncertainties associated with recycle is necessary to expeditious handling. Specifying specific wastes and specific methods of disposal narrows the pathways and timeframes to manageable numbers.

11. Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance.

*Discussion:* Survey programs and quality control programs will be needed to provide reasonable assurance that actual wastes disposed of under an exemption rule meet the specified parameters. Since disposal would be exempted based on both established

and projected waste characteristics, reporting on the wastes actually transferred for below regulatory concern disposal will be important and should be practical.

12. The offsite treatment or disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes.

*Discussion:* The evaluation of expected exposures should provide the basis for meeting this criterion. However, this is an area where NRC will have a continuing responsibility as multiple petitions are processed. Reporting on actual disposals will help NRC address this responsibility and monitor the adequacy of the limits included in the exempted disposals.

13. The methods and procedures used to manage the wastes and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials.

*Discussion:* Since the receiving facility will not be licensed for radioactive materials, special handling or measures should not be required at the processing or disposal sites because of the radioactive content of the wastes. This criterion also means that realistic assumptions about the disposal methods have been made in estimating exposures.

14. There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods.

*Discussion:* To have practical use, the disposal option must be available. For example, if all hazardous waste facilities that accept offsite wastes are closed or are not reasonably distributed, the practicality of an exemption to allow disposal at such sites is questionable. Since the receiving facility will not be licensed for radioactive materials, shipments to landfills or hazardous waste facilities should not require identification as radioactive materials.

#### IV. Administrative Handling

Agency procedures for expeditious handling of petitions for rulemaking were initially published in 1982 in NUREG/BR-0053, "Regulations Handbook."<sup>1</sup> The procedures are contained in Part 11 of the Handbook and were most recently revised in September 1985. Because of resource limitations and other factors, these procedures have not been fully implemented. Petitions for rulemaking submitted in accordance with the Commission's policy statement and this staff implementation plan will be processed in full compliance with these procedures. These procedures conformed with agency policy to complete all rulemaking within 2 years will provide

expeditious action on the petitions. In addition, the Handbook notes general scheduling advice that proposed rules to grant petitions should be published in 6-12 months after acceptance and publication for comment. Proposed rules will be forwarded to the Commission on a 6-month schedule to the extent permitted by resource limits, the nature and extent of public comments, and internal Control of Rulemaking procedures. Rulemakings involving power reactors must be reviewed by the Committee on Review of Generic Requirements prior to publication. Proposed rules involving reactors will therefore be forwarded to the Commission on a 7-month schedule to the extent permitted by resources, comments, and approval procedures. In both cases, every effort will be made to publish proposed rules no later than 12 months after noticing for public comment.

Although the procedures in Part 11 of NUREG/BR-0053 include fast track processing, the nature of the anticipated petitions do not fully comply with the decision criteria to follow this alternative.

Some of the key features of the handling procedures include the following steps for complete and fully supported petitions.

1. Petitioners may confer on procedural matters with the staff before filing a petition for rulemaking. Requests to confer on procedural matters should be addressed to: The Director, Division of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Chief, Rules and Procedures Branch.

2. Petitions should be addressed to: The Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. In keeping with 10 CFR 2.802(f), petitioners will be promptly informed if the petition meets the threshold requirements for a petition for rulemaking in 10 CFR 2.802(c) and can be processed in accordance with this implementation plan. Ordinarily this determination will be made within 30 days after receipt of the petition.

3. Following this determination, the petition will be noticed in the *Federal Register* for a public comment period of at least 60 days.

4. The petitioner will be provided copies of all comments received, scheduling information, and periodic status reports.

The procedures in NUREG/BR-0053 also include the process for denial and withdrawal of petitions.

**Footnotes:**

<sup>1</sup> Copies of NUREC/BR-0053, NUREC/BR-0058 and NUREC/CR-2585 may be purchased through the U.S. Government Printing Office by calling (202) 275-2060 or by writing to the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5185 Port Royal Road, Springfield, VA 22161. Copies are available for inspection and/or copying for a fee in the NRC Public Document Room, 1717 H Street, N.W., Washington, DC 20555.

<sup>2</sup> ICRP Publication 46, "Radiation Protection Principles for the Disposal of Solid Radioactive Waste," adopted July 1985.

<sup>3</sup> ICRP Publication 26, "Recommendations of the International Commission on Radiological Protection," adopted January 17, 1977. ICRP Publication 30, "Limits for Intake of Radionuclides by Workers," adopted July 1978.

<sup>4</sup> Copies of the United Kingdom's document are available for inspection as enclosures to SECY-85-147A (relating to 10 CFR Part 20) dated July 25, 1985 in the Commission's Public Document Room, 1717 H Street NW, Washington, DC 20555. The United Kingdom documents are available for sale from: Her Majesty's Stationery Office, P.O. Box 569, London SE1 9NH, United Kingdom, as Advice document ASP-7 and a related technical report, "The Significance of Small Doses of Radiation to Members of the Public," NRPB-R175.

<sup>5</sup> Copies of the Canadian document are available for inspection as an enclosure to SECY-85-147A (relating to 10 CFR Part 20) dated July 25, 1985 in the Commission's Public Document Room, 1717 H Street NW, Washington, DC 20555. The Canadian document was issued as Consultative Document C-85, "The Basis for Exempting the Disposal of Certain Radioactive Materials from Licensing" by the Atomic Energy Control Board, P.O. Box 1046, Ottawa, Ontario, Canada, K1P 5S9.

<sup>6</sup> ICRP/85/C-03, "Statement from the 1985 Paris Meeting of the International Commission on Radiological Protection," 1985-04-26.

[FR Doc. 86-19550 Filed 8-28-86; 8:45 am]

BILLING CODE 7590-01-M



## APPENDIX B

Sample Final Rule Notice,  
10 CFR Part 40 on Groundwater

**PART 1610—(AMENDED)**

1. The authority citation for 7 CFR 1610 continues to read:

**Authority:** 85 Stat. 29 et seq.; 7 U.S.C. 931 et seq.; as amended at Pub. L. 93-32, 87 Stat 65 et seq.

2. The text of § 1610.5 is designated as paragraph (a) and new paragraph (b) added to read as follows:

**§ 1610.5 Concurrent REA and Bank loans.**

(a) \* \* \*

(b) Except as provided below, notes for loans approved by the Governor on or after December 1, 1987, shall provide that each advance thereunder shall bear interest at the cost of money rate determined by the Governor, prevailing at the time of such advance. The interest rate will be determined monthly by the Governor. Existing unprocessed loan applications that have progressed to the stage that the applicant has been notified in writing of the characteristics of the loan by the publication date of this rule, will be processed in accordance with the previous rule at the option of the applicant. The fixed interest rate for these loans will be the current RTB rate of seven and one half (7.5) percent. Such applicants must notify the Governor in writing of the exercise of such option by December 18, 1987 or such loans shall be processed in accordance with the above rule. The RTB can not assure that requisitions for advance received after the 16th of the month will be advanced in that month.

Dated: November 9, 1987.  
 Jack Van Mark,  
*Acting Governor, Rural Telephone Bank.*  
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**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 40**

**Uranium Mill Tailings Regulations; Ground-Water Protection and Other Issues**

**AGENCY:** Nuclear Regulatory Commission.  
**ACTION:** Final rule.

**SUMMARY:** The Nuclear Regulatory Commission (NRC) is amending its regulations governing the disposal of uranium mill tailings. The changes incorporate into existing NRC regulations the ground-water protection regulations published by the Environmental Protection Agency (EPA) for these wastes. This action is being

taken to comply with the mandate in the Uranium Mill Tailings Radiation Control Act and the NRC Authorization Act for FY 1983 to conform the NRC regulations to the standards promulgated by the EPA.

**EFFECTIVE DATE:** December 14, 1987.  
**ADDRESS:** Comments received on the advance notice of proposed rulemaking and proposed rule may be examined at the Commission's Public Docket Room, 1717 H Street NW., Washington, DC between 7:30 am and 4:15 pm weekdays.

**FOR FURTHER INFORMATION CONTACT:** Robert Fonner, Office of the General Counsel, telephone (301) 492-6692, or Kitty S. Dragonette, Division of Low-Level Waste Management and Decommissioning, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 427-4763.

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**I. Background**

The Nuclear Regulatory Commission (NRC or Commission) is issuing additional modifications to its regulations for the purpose of conforming them to generally applicable requirements promulgated by the Environmental Protection Agency (EPA). The EPA requirements contained in Subparts D and E of 40 CFR Part 192 (48 FR 45926; October 7, 1983) apply to the management of uranium and thorium byproduct material and became effective for NRC and Agreement State licensees and license applicants on December 6, 1983. This action modifies existing regulations of the Commission to incorporate the EPA ground-water protection requirements found in 40 CFR Part 192. The affected Commission regulations are contained in Appendix A to 10 CFR Part 40, which was promulgated in final form on October 3, 1980 (45 FR 65521) and amended on October 16, 1985 (50 FR 41852) to conform to the provisions of the EPA standards affecting matters other than ground-water protection.

EPA developed and issued its regulations pursuant to section 275b. of

the Atomic Energy Act of 1954, as amended (AEA) (42 U.S.C. 2022); section 275b was added by section 206 of Pub. L. 95-604, the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). These EPA regulations included, by cross-reference, certain regulations issued by EPA under the Solid Waste Disposal Act (SWDA). Under section 18(a) of Pub. L. 97-415, the Nuclear Regulatory Commission Authorization Act for fiscal years 1982 and 1983, the Commission was directed to conform its regulations to EPA's with notice and opportunity for public comment.

The additional action that the Commission might take to amend its mill tailings regulations for ground-water protection was the subject of an advance notice of proposed rulemaking (ANPRM) published for comment on November 26, 1984 (49 FR 46425). The NRC issued a notice of proposed rulemaking on ground-water protection on July 8, 1986 (51 FR 24697).

**II. Description of Proposed Amendments**

The EPA requirements in 40 CFR Part 192 (48 FR 45926) included, by cross-reference, ground-water protection standards in 40 CFR Part 264. Part 264 was promulgated by the EPA pursuant to authority provided by the Resource Conservation and Recovery Act (RCRA), which amended the SWDA. Part 264 itself contains references to other EPA rules and a number of internal cross references. The proposed modifications were intended to conform the NRC rules to the provisions of 40 CFR Part 192 not addressed in the earlier conforming action (50 FR 41852; October 16, 1985). The following specific sections of 40 CFR Part 264 were proposed for incorporation in modified text form into Appendix A. (Note that 40 CFR Part 192 incorporated SWDA rules as codified on January 1, 1983.) EPA imposed these sections in its final standards published October 7, 1983 (48 FR 45942).

- Subpart F:
  - 40 CFR 264.92 Ground-water protection standard.
  - 40 CFR 264.93 Hazardous constituents.
  - 40 CFR 264.94 Concentration limits.
  - 40 CFR 264.100 Corrective action program.
- Subpart G:
  - 40 CFR 264.111 Closure performance standard.
- Subpart K:
  - 40 CFR 264.221 Design and operating requirements for surface impoundments.

EPA suggested that NRC address the following specific sections in implementing the list of imposed sections. However, EPA did not make them legally binding requirements on NRC and Agreement States mill licensees and they were not included in the proposed rule. NRC will review these and other SWDA regulations intensively for their potential application to mill tailings disposal in complying with section 84a(3). This provision of the Atomic Energy Act requires the NRC to review the full suite of SWDA requirements for comparable hazardous materials in order to ascertain which, if any, should be

applied to mill tailings, in addition to the specific SWDA rules referenced in 40 CFR Part 192. These later are subject to conformance pursuant to sections 84a(2) and 275f(3) of the Atomic Energy Act. Some of the additional matters to be reviewed are found in the following EPA rules:

- Subpart F:**  
 40 CFR 264.91 Required programs.  
 40 CFR 264.95 Point of compliance.  
 40 CFR 264.96 Compliance period.  
 40 CFR 264.97 General ground-water monitoring requirements.  
 40 CFR 264.98 Detection monitoring program.  
 40 CFR 264.99 Compliance monitoring

- program.  
**Subpart G:**  
 40 CFR 264.117 Post-closure care and use of property.  
**Subpart K:**  
 40 CFR 264.226 Monitoring and inspection.  
 40 CFR 264.228 Closure and post-closure care.

The information set out in Table 1 shows the status of the specific ground-water provisions imposed by EPA regulations and indicates the location of the provision in the changes to NRC's rules. (Note that the clarifying changes to the final rule do not affect the information provided in the table.)

TABLE 1.—RELATIONSHIP OF 40 CFR AND 10 CFR PROVISIONS

EPA designation	Subject	NRC designation in appendix A to 10 CFR Part 40
<b>Subpart D (Uranium)</b>		
40 CFR 192.30	Applicability	Introduction
40 CFR 192.31	Definitions and cross-references	Introduction
40 CFR 192.32(a)(1)	Impoundment design (primary ground-water standard)	5A(1)
40 CFR 192.32	Secondary ground-water standard	5B(1)
(a)(2)		
(i)	Mo and U added	Criterion 13
(ii)	Radioactivity limits	5C
(iii)	Detection monitoring	7A
(iv)	ACL conditions	Deleted
(v)	EPA concurrences	Deleted
40 CFR 192.32(a)(3) and (4)	(Non ground-water)	Criterion 8
40 CFR 192.32 (b) (1) and (2)	Closure standard	Criterion 6
40 CFR 192.33	Corrective actions	5D
40 CFR 192.34	Effective date	
<b>Subpart E (Thorium)</b>		
40 CFR 192.40	Applicability	Introduction
40 CFR 192.41		
(a)	Thorium same as uranium	Factored into text
(b)	(Non ground-water)	Criterion 6
(c)	Radium 226 same as 226	Factored into text
(d)	(Non ground-water)	Criterion 8
40 CFR 192.42	Procedure for alternate standards	Deleted
40 CFR 192.43	Effective date	
<b>Referenced Regulations</b>		
40 CFR 264.92	Ground-water standard	5B(1)
40 CFR 264.93		
(a)	Hazardous constituents and Appendix VIII of 40 CFR 261	5B(2)(a)-(c), Criterion 13
(b)	Excluding hazardous constituents	5B(3)
(1)(i)-(ix)	Ground-water factors	5B(3)(a)(i)-(ix)
(2)(i)-(x)	Surface water factors	5B(3)(b)(i)-(x)
(c)	Aquifer status	5B(4)
40 CFR 264.94		
(a)(1)-(3)	Concentration limits	5B(5)(a)-(c), 5C
(b)	Alternate concentration limits	5B(6)
(1)(i)-(ix)	Ground-water factors	5B(6)(a)(i)-(ix)
(2)(i)-(x)	Surface water factors	5B(6)(b)(i)-(x)
(c)	Aquifer status	5B(4)
40 CFR 264.100		
(a)	Corrective action	5D
(1)-(4)	Procedural	Deleted
(b)	Remove or treat	5D
(c)	Procedural	Deleted
(d)	Monitoring program	7A
(e)	Action to site boundary	5D
(1)	Procedural	Deleted
(2)	Terminating program	5D
(f)	Terminating program	5D
(g)	Procedure	Deleted
(h)	Procedural	Deleted
40 CFR 264.111 (a) & (b)	Closure standard	Criterion 6
40 CFR 264.221		
(a)	Liner design	5A(1)
(1)	Liner properties	5A(2)(a)
(2)	Liner foundation	5A(2)(b)
(3)	Liner area	5A(2)(c)
(b)	Exemption from 264.221(a)	5A(3)
(1)-(4)	Factors in exemption	5A(3)(a)-(d)
(c)	Impoundment overtopping	5A(4)
(d)	Soil design	5A(5)
(e)	Procedural	Deleted

### III. Overview of Comments in Response to the Proposed Rule

The NRC issued a notice of proposed rulemaking on ground-water protection for uranium mills on July 8, 1986 (51 FR 24697). The comment period on the proposed rule originally expired on September 8, 1986 but was extended until November 7, 1986 (51 FR 32217; September 10, 1986). Twelve commenters responded with thirteen sets of comments. Respondents included three environmental or public interest groups, four industrial representatives, three states, the EPA, and the Department of the Interior.

Comments were offered on both general issues and the specific changes in the proposed rule and reflected diverse views. The general issues included the scope of the rulemaking, the EPA standards, implementation and enforcement of the standards, and other miscellaneous topics. Most of the general issue comments were restatements of earlier views on the same issue. No major new issues were raised that had not been aired in one or more of the previous rulemaking actions associated with NRC's conformance to the EPA standards.

The scope of the proposed rule was limited to incorporating requirements legally imposed by 40 CFR Part 192 into NRC rules. General requirements to address section 84a(3) of the AEA requirements for comparability with EPA requirements for similar materials under SWDA were not proposed. Some commenters urged NRC to expand the scope of the rulemaking and others agreed with NRC's proposed rule. Commenters offered both supportive and opposing comments on the overall strategy reflected by the EPA regulations and on specific provisions of those regulations. Implementation and enforcement issues included concern about the dual regulation resulting from recent EPA rulemaking in 40 CFR Part 61 on mill operations.

The proposed rule included changes to the Introduction and Criteria 5, 6, and 7 of Appendix A and the addition of new Criterion 13. Comments were offered on each. Comments addressed four of the 14 proposed definitions in the Introduction. Industry was concerned about the consequences of defining the saturated zones from leaking impoundments as aquifers. Environmental commenters urged a point of compliance closer to the impoundments. Comments on the primary design standard were extensive and divergent. For example, environmental groups objected to flexibility for alternatives to synthetic

liners and industry opposed the use of synthetic liners. Comments on the secondary standard were also extensive. Industry commented that the focus of the standard is ground water naturally present before operations began. The provisions dealing with how to establish which constituents to monitor were particularly confusing to commenters. The exclusion of EPA site-specific concurrences on alternate concentration limits and delisting of hazardous constituents was opposed by EPA and environmental groups and supported by industry. NRC's interpretation of the flexibility afforded by section 84c of the AEA continues to be controversial. Environmental commenters opposed the option for alternate concentrations and expressed concern over delays in implementing corrective action programs. The only area where consensus appeared was that the list of constituents in proposed Criterion 13 should be shortened to focus on constituents of concern at mill tailings sites.

A staff analysis of all the comments received is available in the NRC's Public Document Room. The following discussion summarizes and responds to all comments of major or generic significance and to all comments that prompted additional rule changes.

### IV. General Issues

#### Scope of Rulemaking

*Comments:* An environmental group urged NRC not to defer development of detailed prescriptive RCRA comparable requirements under section 84a(3) of the AEA. EPA urged NRC to promptly schedule a third rulemaking or other action requiring EPA concurrence to comply with section 84a(3) if the proposed rule is not expanded. The Department of the Interior suggested that a five-year delay in re-examining the need for comparable rulemaking may be too long in view of the rapid changes occurring in the field and suggested re-examination in two years. Industry commenters supported deferring discretionary rulemaking to add additional RCRA requirements.

Arguments in support of expanded scope included the existing and potential ground-water contamination at mill sites, the view that licensees will contest site specific decisions and guidance documents and delay implementation, and expectation that the industry will recover from its depressed state based on Department of Energy (DOE) actions. EPA commented that the proposed rule does not fulfill NRC's responsibilities under section 84a(3) of the AEA. EPA restated the

view that NRC should incorporate those additional provisions of the SWDA rules listed as appropriate for NRC to address in EPA's October 7, 1983 final rule notice (see 48 FR 45942). EPA objected to NRC's reliance on policies or license conditions to fulfill SWDA comparability until additional rulemaking is undertaken because of lack of opportunity for EPA concurrence as required by section 84a(3). EPA also commented that none of EPA's regulatory decisions concerning other mining or milling wastes have any relevance to NRC's decisions on scope and industry commented that these EPA decisions are relevant and support deferring discretionary rulemaking by NRC.

*Response:* The Commission agrees that this conforming action does not fully satisfy section 84a(3) and that a third round of rulemaking will probably be necessary to comply fully. The Commission also agrees that regulation of ground-water contamination from mill tailings impoundments is warranted but considers the real issue to be best use of resources and the level of detail needed to accomplish effective regulation. The Commission considers that the most responsible use of limited resources is to: (1) Complete conformance, (2) not duplicate major work EPA is doing, (3) focus on site-specific implementation and enforcement of the basic standards at existing sites, and (4) use the collective NRC and Agreement State implementation experience to provide a more sound basis for future section 84a(3) rulemaking.

Detailed regulations would not eliminate the licensee's right to propose alternative implementation requirements under section 84c and use this means to contest and delay implementation. The Commission agrees with commenters that detailed regulations could provide licensees with a better understanding of what is expected and could reduce the burden on licensees to develop alternatives. However, the site specific and technical problems described by commenters emphasize the difficulty of addressing these matters in regulations.

The view that the nonviability of the industry is a temporary matter is not reflected in the Secretary of Energy's latest finding on viability or with the State of Wyoming's assessment of the future of the industry in that State. In Secretary John S. Herrington's letter to the President dated December 19, 1986, he stated that "I have determined that for the calendar year 1985, the domestic uranium mining and milling industry was not viable." In a November 1986 report, Wyoming stated " . . . it seems

unlikely that the uranium mining and milling industry will ever again play a significant role in Wyoming's mineral economy. The reserves are here, but market and competition factors make the future appear bleak, to say the least."

The additional regulations that EPA and others suggested NRC address are undergoing major revision by EPA. 40 CFR 264.98 and 264.99 are two sections suggested for incorporation into NRC rules to address section 84a(3) SWDA comparability. However, a final EPA rule (July 8, 1987; 52 FR 25942) significantly changed these provisions. They did require analyses of all 40 CFR Part 261, Appendix VIII constituents (i.e., the list in Criterion 13 of this rulemaking without the 40 CFR 192 additions). In the proposed rule (July 24, 1986; 51 FR 26632) EPA acknowledged major practical and technical problems with these analyses. The final rule notes the evolving nature of these specific provisions. An advance notice of proposed rulemaking published by EPA August 20, 1986 (51 FR 29812) addresses technical difficulties with the prescriptive statistical test included in 40 CFR Part 264. This test is included in the regulations EPA indicated NRC should address. A proposed EPA rule addressing some of the difficulties was published August 24, 1987 (52 FR 31948) for public comment. The Commission views the acknowledged technical difficulties with these provisions of 40 CFR Part 264 to be sufficient reason to delay conformance to them. NRC should not duplicate the EPA effort by trying to develop the technical, environmental, and cost/benefit analyses to support similar rulemakings.

Prior to NRC's establishment of "general requirements," NRC can monitor EPA's rulemaking and consult on specific issues as necessary.

EPA has issued two notices on regulation of other mining and milling wastes: (1) 51 FR 24496; July 3, 1986 and (2) 51 FR 36233; October 9, 1986. EPA is correct that these notices have no direct legal bearing on NRC and Agreement State licensees. EPA is addressing how it plans to regulate mining and milling wastes other than uranium and thorium mill tailings. Based on technical considerations, however, the Commission continues to anticipate that EPA's developments in this area may be relevant to implementation of 40 CFR Part 192 and to additional requirements that the Commission may establish under section 84a(3) of the AEA. Common technical aspects apparent from these 1986 notices concern volumes, impoundment size, climate,

remote location, deep ground water, and backfitting to existing sites.

When NRC should initiate a third rulemaking is difficult to specify. For example, EPA hopes to propose regulations for other mining and milling wastes by mid-1988. The timing for a final EPA rule statistical tests is uncertain. EPA may also initiate additional rulemaking on monitoring on other relevant topics as these standards are implemented. Recovery of the industry remains uncertain. The recommendation to reassess in two years instead of five has merit. The Commission will periodically reassess (e.g., about every two years) the question of when a third rulemaking should be initiated.

#### *Comments on 40 CFR Part 192*

*Comments:* Comments on the basic value, validity, lawfulness, or appropriateness of EPA's regulations were explicitly not requested. However, commenters offered comments on the overall strategy reflected by the EPA regulations and on specific parts of the regulations imposed. The latter are discussed later under the specific proposed modifications. A public interest group commented that a more clearly defined and protective purpose is needed based on protection of all ground water regardless of quality with no provisions for any flexibility.

*Response:* Such a change in strategy would require EPA to change 40 CFR Part 192 and referenced regulations and is therefore outside the scope of this action.

#### *Implementation and Enforcement*

*Comments:* An environmental group urged the NRC to reiterate that 40 CFR Part 192 is directly in force on NRC and Agreement State licensees and to aggressively enforce those standards. Industry urged more responsiveness to site specific alternatives proposed by licensees. Industry identified the overlap between recent EPA Clean Air Act work practice standards for mills added to 40 CFR Part 61 (51 FR 34056; September 24, 1986) and NRC's implementation and enforcement of 40 CFR Part 192 and expressed concern about NRC's continued ability to consider site specific alternatives.

*Response:* The Commission is implementing and enforcing the EPA standards as required by law. The language in section 84c of the AEA was incorporated into the Introduction of Appendix A to 10 CFR Part 40. The NRC is thus obligated to consider site-specific alternatives proposed by licensees by law and agency rules. If a licensee disagrees with the site specific decision

on the proposed alternative, agency procedures provide an avenue for review.

Industry is correct that EPA's Clean Air Act standards in 40 CFR Part 61 require site-specific EPA actions, e.g., EPA approval to construct a new impoundment. The EPA 40 CFR Part 61 standards incorporate the ground-water protection standards in 40 CFR 192.32(a); thus, both EPA and NRC will be implementing and enforcing these standards. NRC has no legal basis to challenge this dual regulation. NRC jurisdictional arguments rejecting EPA site specific actions are based on EPA actions under the Atomic Energy Act and have no applicability to EPA Clean Air Act actions.

#### *Other*

*Comments:* A State commented that NRC should view the requirement for compatible Agreement State regulation, to the extent practicable, as giving Agreement States rulemaking latitude when warranted by the economic burden on State agencies. Another State commented that "it should be clear that where States standards are more stringent than Federal standards then the State standards should apply."

*Response:* The first State appears to be suggesting that the resource burden of issuing regulations that are compatible with the Commission's should be considered and might be sufficient grounds for the State not to adopt compatible regulations. The Commission does not read section 274o of the AEA as providing this consideration. Agreement States will need to amend their regulations. However, as reflected in 10 CFR 150.31(d), States may adopt alternative generic or site-specific standards with Commission approval and public notice. The second State seems to be addressing the circumstance when NRC and a non-Agreement State are regulating the same constituent under concurrent jurisdiction but have different numerical limits and legal bases. NRC would have no authority to implement and enforce the more stringent State limit. NRC has not asserted Federal preemption that would preclude the State from implementing and enforcing its ground-water protection requirements at mill sites for non-radiological contaminants. State standards would be preempted only if in direct conflict with the Federal standards.

*Comment:* Only one commenter addressed the cost/benefit information in the notice and that comment was

limited to a legal view that the analysis was not required.

*Response:* The Commission agrees that no analysis was required and so stated in the proposed rule.

#### V. Comments on Specific Proposed Modifications to Appendix A of 10 CFR Part 40

##### Introduction

Definitions of 14 terms were proposed as additions to the Introduction. Comments were received on four of the definitions: Aquifer, existing portion, ground water, and point of compliance.

*Comments:* Industry comments urged changes to clarify that temporary aquifers from impoundment seepage should not be considered "aquifers" and that a beneficial use criterion be applied to "ground water."

*Response:* The proposed definitions of "aquifer" and "ground water" were quoted verbatim from 40 CFR 260.10. The comments on "aquifer" and "ground water" are addressing the same concepts because aquifers contain ground water.

The Commission agrees that a reasonable reading of the EPA secondary standard would allow flexibility in how the saturated zone from operations at existing sites is considered. The Commission agrees with commenters that the fundamental role of background levels of constituents (i.e., background is a baseline level that triggers action and background is one of the options for setting protective concentration limits for constituents) in the EPA standards contributes to a view that operationally created zones are not the aquifers of primary concern. This view is further supported by the prescriptive requirements EPA has adopted for its own implementation of the standards. For example, the EPA rules address how to obtain upgradient values and how to determine statistical increases over background. For new facilities or impoundments, the situation is clear that the uppermost aquifer of concern is the naturally occurring one.

The Commission does not agree with the commenters that the saturated zones can be dismissed generically. Decisions will be site specific and the Commission notes that there may be circumstances where corrective actions involving these zones may be required under the provisions of paragraph 5D whether or not the zones are defined as aquifers. The Commission is adding a sentence to the EPA definition of aquifer to address when the saturated zones are of sufficient direct concern to be designated as aquifers. The clarification is based on present and potential

impacts from the zones and is consistent with EPA's consideration of the system of aquifers at the site in the definition of uppermost aquifer and EPA's "Groundwater Protection Strategy." August 1984 provided by EPA in the agency's comments on the ANPRM. It is also consistent with the EPA discussion of comments on the term "aquifer" in the July 26, 1982 rulemaking on 40 CFR Parts 123, 260, 264, and 265 (47 FR 32289) in that near-surface soils saturated only as a result of disposal activity may not be the uppermost aquifer of concern.

Licensees would be expected to show that the zones are not and will not be interconnected to natural aquifers, that the zones do not and will not discharge to surface waters, and that the zone will remain confined to land under long-term government ownership and control. For example, licensees may be able to demonstrate that once the hydraulic head from the impoundment is gone, the zone will remain potentially yielding for only a short period of time and that the additional movement after closure will be limited. Under the regulatory scheme already in place for tailings (e.g., see Criterion 11 of Appendix A to 10 CFR Part 40), long term government ownership and control is authorized and expected. Institutional control of access to the area directly beneath the impoundments and associated features necessary to comply with the long-term stability portions of the standard could be reasonably expected to prevent access and use of water from these zones.

The Commission notes that this view of the saturated zones is related to the secondary standard and has no bearing on decisions concerning the primary standard. The primary standard (use of impermeable liners) is intended to prevent the occurrence of such saturated zones.

Commenters also addressed the qualitative test of an aquifer yielding a "significant amount" of water, but the Commission has concluded, as did EPA (e.g., see 47 FR 32289; July 26, 1982), that a quantitative definition is a regional decision and sometimes even a site specific decision. This aspect of the definition remains unchanged. The Commission is also adding a cross reference to the definition of aquifer in the definition of "ground water."

*Comment:* An industry commenter objected to the September 30, 1983 date in the definition of "existing portion" based on the legal view that NRC could not include a retroactive date.

*Response:* The Commission has consistently held that the standards in 40 CFR Part 192 were effective for NRC and Agreement State licensees on their

effective date of December 6, 1983. Thus licensees were bound by the September date whether so stated in NRC's regulations or not; therefore, the date is not retroactive.

*Comment:* One commenter suggested that NRC develop more stringent requirements for "point of compliance" than those imposed by EPA's full suite of SWDA regulations. For example, designation of a horizontal plane in the unsaturated zone under the impoundment rather than EPA's uppermost aquifer and a location that provides at least two years of plume travel time before the plume would reach the site boundary were suggested.

*Response:* No definition for "point of compliance" was imposed by 40 CFR Part 192. The proposed definition was intended to be procedural and was included in order to fully reflect 40 CFR 264.92, which was imposed. The objective of the point of compliance is described in paragraph 5B(1) being added to Appendix A of 10 CFR Part 40. The Commission considers any additional requirements to be outside the scope of this nondiscretionary rulemaking. The Commission notes that an existing provision in NRC rules in 10 CFR Part 40 is related to the commenter's concern. This existing provision that requires a leakage detection system under synthetic liners to detect major failures is being designated as 5E(1) by this action.

##### Criterion 5

##### Paragraph 5A

*Comments:* Comments were received only on paragraphs 5A (1) and (3). One commenter objected to the exemption from an impermeable liner because contaminated soils would be allowed and the contamination would eventually migrate. A general recommendation was made that impoundments be designed with treatment systems to deal with liner failure. Industry repeated views that the EPA primary design standard does not reflect a reasonable balancing of costs and benefits or provide sufficient site specific flexibility to meet Congressional intent and it exceeds EPA's authority.

Industry argued the merits of clay liners over synthetic ones and urged the addition of realistic flexibility to approve clay liners. One commenter suggested that the Commission use its authority to establish levels below which regulation is required (i.e., de minimis levels) to accommodate clay liners and provide relief from the absolute language for alternatives findings. Addition of a liner exemption if

wastes will not enter an aquifer or reach surface water because of local site conditions and revisions of the primary standard to a goal aimed at preventing only "significant" migration were suggested. One commenter suggested an editorial reference in 5A(1) to the exemption in 5A(3).

*Response:* The language in paragraphs 5A (1)-(5) incorporate the text imposed by 40 CFR Part 192 virtually without change. Thus most of the comments are actually directed at 40 CFR Part 192, not NRC's action.

The Commission agrees that a finding that residual contamination will not migrate to ground or surface water at any future time will be very difficult but has no basis to conclude that such a finding could not be made and defended. Addition of treatment system requirements for leaks would be discretionary and outside the scope of this action. As noted earlier, Appendix A already requires a leakage detection system under new synthetic liners.

Industry arguments on the merits of clay liners repeated comments made on the proposed EPA standards and rejected by EPA in its final rule. EPA acknowledged and discussed the pros and cons of synthetic liners and liners of natural materials (e.g., 48 FR 45931; October 7, 1983) and concluded that the disadvantages of synthetic liners were not sufficient to deviate from the SWDA requirements.

Use of de minimis findings to modify the text being incorporated would lead to substantive changes. The Commission considers that it has legal flexibility in implementation and enforcement of the standards to consider de minimis quantities but cannot substantively alter the standards themselves. This view is supported by EPA's indication that synthetic liners meet the intent of the standard of no migration into the liner even though migration into properly functioning liners made of these materials will occur at very slow rates during the operation and closure phases.

A generic exemption from liners if wastes will not enter an aquifer or reach surface water is not completely consistent with the EPA standards. NRC must find that the basic standard for granting exemptions is met on a site specific basis and consider the prescribed factors in making that finding. The suggested language is a simplified paraphrase of the basic EPA standard and unnecessary.

The suggested editorial cross reference is being made.

#### Paragraph 5B

Paragraph 5B consists of Paragraphs 5B (1)-(6) and comments were received on all paragraphs except 5B(4).

*Comments:* Industry commenters suggested editorial changes to Paragraph 5B(1) to clarify that the focus of protection is ground water that was naturally present before operations began.

*Response:* The editorial comments are in the nature of reinforcement of earlier comments on the definitions of "ground water" and "aquifer." The clarifying sentences being added to the definitions of these terms address the issue of when the seepage from an impoundment would be considered an aquifer for purposes of Appendix A of 10 CFR Part 40 and no additional changes are needed. On its own volition, the Commission is also clarifying the last sentence of 5B(1) to indicate that the intended purpose of adjusting the point of compliance is to locate the point of compliance in the center of the flow of contaminated ground water based upon developed data and site information as to the flow of ground water or contaminants.

*Comments:* Paragraph 5B(2) outlines the three definitional tests from 40 CFR Part 264 that a constituent must meet in order to qualify as a hazardous constituent for which protective concentration limits must be set. One commenter emphasized that efficient implementation of the definitional scheme in 5B(2) requires serious consideration of the list to determine what is reasonably expected to be in or derived from the byproduct material and that licensees should not have to monitor for all the constituents listed in proposed Criterion 13.

*Response:* The Commission agrees that reasonable implementation of 5B(2) requires serious consideration of what is reasonably expected to be in or derived from the tailings. The proposed rule was not intended to require that licensees monitor for the full list. Monitoring for the full list is contained in 40 CFR 264.97-264.99, sections not imposed by EPA. The Commission is clarifying 5B(2) to emphasize that all three tests must be met before a concentration limit must be set for a constituent.

Specifying which constituents a licensee will monitor for will be a site-specific decision. A reasonable approach to developing a site-specific list for monitoring at an existing site might involve the following steps:

(1) Use information on the constituents such as that contained in EPA's proposed rule (51 FR 26632; July 24, 1986) and final rule (52 FR 25942; July

9, 1987) to eliminate constituents that are unstable in water or not amenable to standard assay.

(2) Consider indicators for families or groups of compounds on the list.

(3) Carefully review administrative records and data to determine how defensible this information is in defining which constituents may and may not be present and where the uncertainties are and.

(4) Sample existing tailings to establish which constituents are present.

The Commission recognizes that for new impoundments, administrative controls coupled with analyses of the ore can provide an effective means of controlling and identifying which constituents are being added to the new impoundment.

NRC is conducting an impoundment liquids sampling program. Results to date confirm the general consensus that many of the listed constituents are not present in the sampled impoundments. NRC's experience may be useful to licensees in developing sampling programs and it will facilitate review of licensee programs and results. NRC's program suggests that impoundment sampling is a feasible option for a licensee to pursue to help address which constituents could be expected to be in or derived from existing impoundments.

*Comments:* Two commenters suggested deleting Paragraph 5B(3) which incorporates the provision to exclude detected constituents if they will not pose a significant present or potential hazard to human health or the environment. One objected to any unregulated pollution by a known hazardous material and one read the incorporated language as giving NRC authority exceeding that EPA intended for itself. The commenter stated that EPA use of this exemption is limited to exclusion from monitoring only. An environmental commenter disagreed with NRC's legal view that EPA exceeded its jurisdiction in 40 CFR Part 192 by requiring site-specific concurrences before any exemption of constituents is final. Industry commenters supported NRC's view. Both positions claimed support in the legislative history and statutory language. One commenter disagreed with the Commission's view that EPA concurrence is a procedural rather than substantive matter. Industry commenters suggested consideration of natural geochemical processes in exempting constituents and establishing background values for constituents.

*Response:* The imposed standards include the provision to exclude detected constituents and NRC must

include it for completeness. The second commenter's reading of the provision is flawed. Being absent from the tailings leachate is sufficient basis to exclude the constituent from any further consideration. Evaluation of factors such as ground-water flow or health risks would not be needed if the constituent is not present. In the Commission's view, paragraph 5B(3) is a health and safety finding based on a pathway analysis that a constituent known to be in the wastes will not pose a short or long term hazard even though it has been released to the uppermost aquifer and therefore no restrictions on its concentration are needed. The Commission is clarifying this point.

Commenters offered no substantive new legal arguments or considerations that were not considered in the Commission's earlier decision on the matter of EPA site-specific concurrences. See the final rule notice for the first step conformance published October 16, 1985 (50 FR 41853 and 41861). As the Commission said in the prior rulemaking:

The Commission historically has had the authority and responsibility to regulate the activities of persons licensed under the Atomic Energy Act of 1954, as amended. Consistent with that authority and in accordance with Section 84c of that Act, the Commission has the discretion to review and approve site specific alternatives to standards promulgated by the Commission and by the Administrator of the Environmental Protection Agency. In the exercise of this authority, Section 84c does not require the Commission to obtain the concurrence of the Administrator in any site specific alternative which satisfies Commission requirements for the level of protection for public health, safety, and the environment from radiological and nonradiological hazards at uranium mill tailings sites. As an example, the Commission need not seek concurrence of the Administrator in case-by-case determinations of alternative concentration limits and delisting of hazardous constituents for specific sites.

In the October rulemaking, the Commission also noted that site specific concurrences contradict the procedural prohibition on EPA's issuance of a permit in section 275b(2) of the Atomic Energy Act.

For both delisting or excluding constituents under paragraph 5B(3) and approving alternate concentration limits under paragraph 5B(6), the Commission is bound by the basic EPA standard that no substantial present or potential hazard to the public health or the environment be posed. The Commission is also required to consider a comprehensive list of factors relating to protection of ground and surface water

as part of the secondary standard. 40 CFR Part 192 also added requirements for constituent levels to be as low as is reasonably achievable and for all practicable corrective action to be taken. Delisting and approval of alternate concentration limits are a normal and integral part of the implementation and enforcement of the substantive EPA secondary standard. EPA concurrences would merely be a review of the adequacy of NRC's site specific implementation of the overall secondary standard in licensing decisions.

Commenters' concerns over NRC's application of section 84c of the AEA and independent action on delisting constituents and alternate concentration limits may stem from a misconception of what the Commission understands alternative site specific standards to be. The Commission would expect a licensee, first, to attempt to meet all regulations and standards as issued. If site-specific circumstances would make compliance physically impossible, technically impracticable, or excessively costly in relation to the benefits to be gained from the reduction of risks, then alternatives should be considered. The alternatives proposed should meet the objectives of the established standards so that NRC can find that the alternatives provide a level of health and environmental protection equivalent, to the extent practicable, to promulgated standards. The Commission does not view the provision as an open invitation to disregard the standards and set new goals, and believes that the language in section 84c requiring an equivalency or more stringent finding precludes such a view. To illustrate, assume the standard has a numerical value of X but meeting X instead of Y would require extraordinary expense or might compromise the soundness of the impoundment structure or safety monitoring features. The alternative limit to be proposed may be Y for the specific circumstances. NRC must find that Y provides equivalent protection, to the extent practicable, to X.

The commenters rejected the Commission's position that site specific concurrences detract from the Commission's statutory discretion under section 84c of the AEA and that the matter is primarily a procedural one. Nevertheless, the Commission continues to believe that rejection of EPA site specific concurrences is the correct legal position. Therefore, the Commission is issuing the final rule without any provision for EPA concurrence in delisting constituents or alternate concentration limits.

The Commission agrees that determining background is difficult at many existing sites. However, it is not completely clear what the difficulties have to do with excluding constituents and how natural geochemical processes are to be considered. In the Commission's view, background measurement problems are not a sufficient basis to exclude constituents when the levels present are clearly higher than background in the area and may pose a significant hazard.

*Comments:* Two commenters objected to the flexibility provided in paragraph 5B(5) for unspecified site-specific alternate concentration limits that may exceed background or drinking water levels. Views on the legality of deleting the provision for EPA concurrences were repeated. Industry expressed concern about the lack of definition of "background." The Department of Interior commented that neither the preamble nor the text make it clear when alternate concentrations are to be applied (e.g., only when background levels are not available).

*Response:* Suggestions to delete the provision for alternate concentration limits are comments on 40 CFR Part 192. The option for alternate concentration limits was legally imposed and NRC must include this substantive provision. From a technical point of view, the alternate concentration limit option is crucial to practical implementation. As stated earlier, the Commission agrees that determining background may be difficult but commenters offered no generic solutions to the difficulty. Decisions on background values will have to be made on a site specific basis.

The EPA secondary standard in 5B(5) is a site-specific choice of three equal options: Background, referenced drinking water limits (see 5C), or alternate concentration limits. However, if the licensee chooses to pursue the alternate concentration limit option, then the licensee must expend the resources to collect the information and do the analyses to support an alternate concentration. The licensee may choose the basic background or drinking water options as the more economic or timely. The licensee would not have to address health and environmental risks with the basic choices because these are conceded to involve acceptable risks. The Commission would be required to independently review the proposed alternate limit and the supporting rationale and agree or set a different limit based on the information available. Alternate concentration limits may be requested without regard to the



availability of background values. The Commission is clarifying this point.

*Comments:* Comments were divided on the language in paragraph 5B(6) referring to contaminate levels being as low as reasonably achievable (ALARA). One commenter objected to ALARA based on a view that ALARA levels might still pose significant hazards. The provision was considered unnecessary and inappropriately applying ALARA to nonradiological constituents. EPA expressed a contrary view that ALARA was not clearly applied to the nonradiological constituents as EPA intended. EPA also viewed the proposed language as giving the ALARA finding primacy over the listed factors to be considered.

*Response:* The issue of how and when ALARA was intended to apply is not completely clear from the preamble to EPA's final rules (46 FR 45941-2; October 7, 1983) or from the text of the rule itself. However, there is no apparent reason to conclude that any distinction was being made between radioactive and nonradioactive constituents and the Commission accepts EPA's views. The Commission's proposed rule included ALARA for emphasis but there was no intent to have ALARA dominate the factors to be considered or the fundamental standard that the "constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration is not exceeded." The Commission is clarifying these points.

*Comments:* Industry and EPA addressed the development of a generic methodology for evaluating alternate concentration limits. Industry asked for comment opportunity. EPA noted that the two agencies had agreed that the development and use of such guidance would provide a means of addressing the differing agency views on the legality of EPA site specific concurrences and suggested that the final regulations recognize that the agencies are committed to such a course of action.

*Response:* Industry's request to review any guidance documents or joint methodologies before they are finalized has merit and NRC usually issues guidance documents for public comment.

When the proposed rule was published, both agencies expected that publication of a comprehensive EPA SWDA guidance document on alternate concentration limits was imminent and staffs were optimistic that the methodology approach would work. However, completion and publication of the SWDA document was delayed until

July 1987. (See 52 FR 27579; July 22, 1987.) Major changes were made to the earlier draft which formed the basis for NRC's expectations. The major changes flowed in part from additional legislation (e.g., 1984 amendments to RCRA and Section 121 of the Superfund Amendments and Reauthorization Act of 1986) and other Congressional direction (e.g., a letter to EPA Administrator Lee M. Thomas dated March 4, 1986 from John Dingell and 10 other members of Congress). The changes appear to make the SWDA guidance impracticable for uranium recovery and inconsistent with the SWDA standards as they stood when EPA incorporated them into 40 CFR Part 192 (EPA incorporated the SWDA standards as codified on January 1, 1983). For the reasons given above, NRC may well need to develop a new methodology clearly unique for tailings. Nonetheless, the Commission will continue to consult with EPA on any methodology developed and still favors resolving the EPA concurrence role called for in 40 CFR Part 192 by adoption of a mutually acceptable generic methodology. As discussed earlier, the Commission is issuing the final rule without any provision for EPA concurrence in delisting constituents or alternate concentration limits.

#### Paragraph 5C

*Comment:* The only comment on this paragraph, which incorporated the drinking water values imposed with supplemental radioactivity limits added, was a suggestion to develop numerical limits for the constituents of concern at tailings sites.

*Response:* As the commenter conceded, the proposed action fulfilled the conformance requirement. Development of limits is outside the scope of this action.

#### Paragraph 5D

*Comments:* Two commenters recommended that corrective action begin before hazardous constituents reach the point of compliance and objected to the potential for an 19-month delay before action begins. One commenter suggested that licensees be required to submit corrective action plans in advance for automatic activation to reduce delays. A two year time limit for corrective actions was also suggested. Industry suggested clarifying that licensees do not have to cleanup naturally occurring contamination or contamination from someone else's operations. Industry views the corrective action programs to be aimed at cleaning up the preoperational

confiners, not the seepage zones from leaking impoundments.

*Response:* The concerns for corrective action before reaching the aquifer are similar to concerns discussed earlier on the definition of "point of compliance." The comments on allowing up to 18 months to begin corrective action programs is a rejection of EPA's change from a 12 month limit in the proposed 40 CFR Part 192 to 18 months in the final rule. The Commission has no basis to overrule this EPA decision. Commenter concerns may stem from a misconception that no actions have been taken or will be taken except in response to the EPA standards. However, NRC licensees had extensive monitoring programs in place and many licensees were conducting mitigative actions prior to the EPA standards.

The comment that corrective action plans be submitted in advance does have merit, particularly for new sites. However, advance plans would be conceptual and may need modification to adequately address the actual circumstances of the failure event. Decisions on this matter will be made on a site-specific basis. The suggestion to impose a two year time limit for corrective action programs before requiring removal to new impoundments presumes that short-term solutions would always be the best choice. The Commission views the nature and duration of corrective action programs to be a very site specific matter and is unable to defend a discretionary requirement for a two year limit.

Concern that licensees not have to cleanup natural or third party contamination is valid if this type of distinction can be made. The difficulty in establishing background would appear to be partially responsible for this comment. The Commission is concerned that arguments over mining seepage versus tailings seepage or similar uncertainties not prevent an orderly implementation of the EPA standards. The concern that the corrective action program be directed at the natural aquifers is addressed in part by the clarifying addition to the definition of "aquifer." Because these decisions are so site specific, the Commission is concerned that attempts to further clarify the matter in the rule may create more problems than they would solve.

#### Paragraphs 5E-H

*Comments:* The only purpose in including these paragraphs in the proposed rule was to designate them as 5E-H for consistency. Industry commenter suggested that 5H be

deleted based on the legal view that NRC does not have regulatory authority over ore storage at mills.

*Response:* Since paragraph 5H was unaffected by the EPA standards being incorporated, substantive change to delete is outside the scope of this action. However, the Commission views the provision as valid.

#### Criterion 6

*Comments:* The proposed addition to Criterion 6 incorporated the imposed nonradiological hazard closure requirement. One commenter suggested application of the closure requirement to radioactive constituents and properties. One noted that the closure standard and the design and operational liner standards may conflict and suggested that the closure requirements have priority. Editorial suggestions addressed the lack of definition or quantification of the term "threat" and the lack of clarity resulting from the use of the three parallel terms "control, minimize or eliminate."

*Response:* The language in 40 CFR Part 192(b)(1) clearly identifies 40 CFR 264.111 as the closure standard for nonradiological hazards. The addition of the radiological constituents and properties to Criteria 5C and 13 assures that these aspects must be addressed in corrective action plans when they are of concern. No additional changes are needed. The comment on potential conflicts is more of an observation and reflects concerns with the primary design standard.

The editorial suggestions are not consistent with the language imposed. The suggested changes appear to be less protective and do not provide quantification or use alternate terms that are defined in EPA's standards. Consequently they are not being made.

#### Criterion 7

*Comments:* The proposed addition to Criterion 7 incorporated the requirements for a detection monitoring program and other information requirements needed to comply with the secondary ground-water standard. One commenter viewed 40 CFR 264.98 as legally imposed and suggested the addition of detailed prescriptive monitoring requirements. An industry commenter urged the Commission to direct staff to consider site specific alternatives for monitoring proposed by licensees.

*Response:* The sentence viewed as imposing 40 CFR 264.98 is: "Detection monitoring programs required under § 264.92 shall be completed within one (1) year of promulgation." While imposition of § 264.98 is one way this

language could be read, the Commission believes that a better reading is that detection monitoring should be established within one year. This view is supported by the fact that the imposed standards in § 264.92 are dependant on site specific data, except for the drinking water values, so that the reference to § 264.98 only serves to illustrate that a monitoring program is necessary to implement § 264.92. This view is also supported by EPA's listing in the preamble to the October 7, 1983 rule of § 264.98 as a section NRC is to address, but not one EPA expressly incorporated in whole or in part. The issue of discretionary rules has already been discussed a number of times.

The comment addressing staff consideration of alternatives does not require any change in the proposed rule. The provision to consider licensee alternatives in accordance with section 84c of the AEA was incorporated in NRC's October 16, 1985 final rule.

A pervasive theme in the comments is the erroneous view that routine monitoring of all Criterion 13 constituents is required. The Commission is clarifying that monitoring for constituents will be determined on a site specific basis.

#### Criterion 13

*Comments:* Commenters agreed that the proposed Criterion 13 contains many constituents that will not be of concern at tailings sites and urged NRC to tailor the list for application to tailings. One commenter suggested adding additional constituents such as sulfates, chlorides, total dissolved solids, and pH because they degrade water quality.

*Response:* Although the Commission agrees that the list in Criterion 13 includes many constituents that will likely never be of concern, shortening the list is outside the scope of this action. If the list is shortened, it would have to be based on one of two findings. One is that the constituent is not inherently hazardous which is not at issue here. The second is that the constituent would never be present in uranium and thorium byproduct material and wastes or the impoundments. Making the second finding would include uncertainties that presently available information does not address (e.g., that ore bodies would not contain new constituents, that new solvents will not be introduced, and that operational or decommissioning wastes will not introduce new constituents). The clarifying language being added to emphasize that licensees are not expected to routinely monitor for all the constituents should reduce concerns that prompted the comments.

The Commission does not believe that the addition of the suggested parameters is technically appropriate. These parameters may only affect the potability of ground water and not qualify as hazardous. Although the list imposed by EPA does not include nitrates, the EPA drinking water regulations for community water supplies include a limit for nitrates. The Commission considers it prudent to add a reference to NRC's authority to add constituents on a site specific basis to allow for a more aggressive approach for contaminants such as nitrates and is doing so. Also, the indicator parameters suggested for addition are likely candidates for NRC attention under the National Environmental Policy Act (NEPA) and many State ground-water programs address these parameters.

## VI. Agency Concurrences

The action covered in this notice is undertaken pursuant to sections 84a(2) and 275f(3) of the AEA and reflects requirements already imposed by EPA, and already subject to implementation and enforcement by NRC under section 275d of the AEA. The Commission considers it inappropriate to consider this rulemaking as requiring EPA concurrence under section 84a(3) of the AEA. Section 84a(3) of the AEA requires NRC to assure that by-product material is managed in a manner that "conforms to general requirements established by the Commission, with the concurrence of the Administrator, which are, to the maximum extent practicable, at least comparable to requirements applicable to the possession, transfer, and disposal of similar hazardous material regulated by the Administrator under the Solid Waste Disposal Act, as amended." No discretionary general requirements pursuant to section 84a(3) are being issued.

## VII. Impact of the Amendments

### A. Finding of No Significant Environmental Impact

The Commission has determined under NEPA and the Commission's regulations in 10 CFR Part 51 that NRC's incorporation of the EPA standards by this action is not a major Federal action significantly affecting the quality of the environment and therefore an environmental impact statement is not required. The significant Federal action was the promulgation by EPA of its regulations on September 30, 1983.

In issuing these additional modifications to its regulations in Appendix A to 10 CFR Part 40, the Commission is completing the action to

conform them to the EPA standards. The purpose of these changes is to clarify previously existing language in promulgated EPA standards and incorporate mandatory requirements into NRC's regulations. This action by the Commission is a consequence of previous actions taken by the Congress and the EPA, and is legally required by sections 84a(2) and 275f(3) of the Atomic Energy Act of 1954, as amended.

Commission action in this case is essentially nondiscretionary in nature, and EPA is viewed as the lead agency. For purposes of environmental analysis, this action rests upon existing environmental and other impact evaluations prepared by EPA in the following documents: (1) "Final Environmental Impact Statement for Standards for the Control of Byproduct Materials from Uranium Ore Processing (40 CFR Part 192)," Volumes 1 and 2, EPA 520/1-83-006-1 and 2, September 1983; (2) "Regulatory Impact Analysis of Final Environmental Standards for Uranium Mill Tailings at Active Sites," EPA 520/1-83-010, September 1983; and (3) Supplementary Information, Interim Final Rulemaking for 40 CFR Parts 122, 260, 264 and 265, "Hazardous Waste Management System; Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; and EPA Administered Permit Programs?" published July 26, 1982 (47 FR 32274). NRC also prepared an overview of the potential actions that might be required of NRC and Agreement state licensees by the EPA standards entitled, "Summary of the Waste Management Programs at Uranium Recovery Facilities as They Relate to the 40 CFR Part 192 Standards," NUREG/CR-4403.<sup>2</sup>

#### B. Impacts Presented in Proposed Rule

The Commission published an overview and update of the impacts on the environment and uranium and thorium milling industry associated with the ground-water protection standards

when they were proposed for incorporation (51 FR 24703-24709; July 8, 1986). The discussion also addressed in general terms the economic and other factors that would be addressed in a comprehensive Regulatory Flexibility Analysis if one was required by this action to meet the requirements of the Regulatory Flexibility Act. The summary information was not intended to be a strict cost/benefit analysis or a technical justification for the standards. It generally related economic cost to the benefit expected from compliance with the standard. The summary information was also intended to help the reader more fully understand the nature and potential impacts of the proposed action.

#### VIII. Paperwork Reduction Act Statement

This final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). These requirements were approved by the Office of Management and Budget under approval number 3150-0020.

#### IX. Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this rule will not have a significant economic impact upon a substantial number of small entities. Therefore, a Regulatory Flexibility Analysis has not been prepared. The basis for this finding includes the nature of the licensees as well as the nondiscretionary nature of this action. Of the 27 licensed uranium mills that have produced tailings, only one qualifies as small entity.

#### List of Subjects in 10 CFR Part 40

Government contracts, Hazardous materials-transportation, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Source material, and Uranium.

#### X. Modifications

Under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, 5 U.S.C. 553, and the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the NRC is issuing the following amendments to 10 CFR Part 40.

#### PART 40—DOMESTIC LICENSING OF SOURCE MATERIAL

1. The authority citation for Part 40 continues to read as follows:

Authority: Secs. 62, 63, 64, 85, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(2), 63, 64, Pub. L. 95-604, 92 Stat. 3033, as amended, 3039, sec.

234, 63 Stat. 444, as amended (42 U.S.C. 2014(e)(2), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2236, 2282), secs. 274, Pub. L. 86-373, 73 Stat. 588 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 68 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846), Sec. 275, 92 Stat. 3021, as amended by Pub. L. 97-415, 96 Stat. 2067 (42 U.S.C. 2022).

Section 40.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); §§ 40.3, 40.25(c) (1)-(3), 40.35 (a)-(d), 40.41 (b) and (c), 40.46, 40.51 (a) and (c), and 40.63 are issued under sec. 181b, 68 Stat. 946, as amended, (42 U.S.C. 2201(b)); and §§ 40.25 (c) and (d)(3) and (4), 40.26(c)(2), 40.35(e), 40.42, 40.61, 40.62, 40.64 and 40.65 are issued under sec. 181c, 68 Stat. 950, as amended (42 U.S.C. 2201(c)).

Appendix A to Part 40 is amended as follows:

#### Appendix A to Part 40—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

2. Introduction to Appendix A is amended by adding the following text at the end of the Introduction:

Introduction. \* \* \*

The following definitions apply to the specified terms as used in this Appendix:

"Aquifer" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs. Any saturated zone created by uranium or thorium recovery operations would not be considered an aquifer unless the zone is or potentially is (1) hydraulically interconnected to a natural aquifer, (2) capable of discharge to surface water, or (3) reasonably accessible because of migration beyond the vertical projection of the boundary of the land transferred for long-term government ownership and care in accordance with Criterion 11 of this appendix.

"Closure" means the activities following operations to decontaminate and decommission the buildings and site used to produce byproduct materials and reclaim the tailings and/or waste disposal area.

"Closure plan" means the Commission approved plan to accomplish closure.

"Compliance period" begins when the Commission sets secondary ground-water protection standards and ends when the owner or operator's license is terminated and the site is transferred to the State or Federal agency for long-term care.

"Dike" means an embankment or ridge of either natural or man-made materials used to

<sup>1</sup> Single copies of the Final Environmental Impact and the Regulatory Impact Analysis may be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. A copy of each document is also available for inspection and/or copying in NRC's Public Document Room, 1717 H Street N.W., Washington, DC 20555.

<sup>2</sup> Copies of NUREG/CR-4403 and NUREG 0706 may be purchased through the U.S. Government Printing Office by calling (202) 275-2080 or by writing to the U.S. Government Printing Office P.O. Box 37082, Washington, DC 20013-7082. Copies may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Copies are available for inspection and/or copying for a fee in the NRC Public Document Room, 1717 H Street N.W., Washington, DC 20555.

prevent the movement of liquids, sludges, solids or other materials.

"Disposal area" means the area containing byproduct materials to which the requirements of Criterion 6 apply.

"Existing portion" means that land surface area of an existing surface impoundment on which significant quantities of uranium or thorium byproduct materials had been placed prior to September 30, 1963.

"Ground water" means water below the land surface in a zone of saturation. For purposes of this appendix, ground water is the water contained within an aquifer as defined above.

"Leachate" means any liquid, including any suspended or dissolved components in the liquid, that has percolated through or drained from the byproduct material.

"Licensed site" means the area contained within the boundary of a location under the control of persons generating or storing byproduct materials under a Commission license.

"Liner" means a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment which restricts the downward or lateral escape of byproduct material, hazardous constituents, or leachate.

"Point of compliance" is the site specific location in the uppermost aquifer where the ground-water protection standard must be met.

"Surface impoundment" means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well.

"Uppermost aquifer" means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

3. Criterion 5 is revised to read as follows:

*Criterion 5*—Criteria 5A-5D and new Criterion 13 incorporate the basic ground-water protection standards imposed by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E (48 FR 45926; October 7, 1983) which apply during operations and prior to the end of closure. Ground-water monitoring to comply with these standards is required by Criterion 7A.

5A(1)—The primary ground-water protection standard is a design standard for surface impoundments used to manage uranium and thorium byproduct material. Unless exempted under paragraph 5A(3) of this criterion, surface impoundments (except for an existing portion) must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, ground water, or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil, ground water, or surface water) during the active life of the facility, provided that impoundment closure

includes removal or decontamination of all waste residues, contaminated containment system components (liners, etc.), contaminated subsoids, and structures and equipment contaminated with waste and leachate. For impoundments that will be closed with the liner material left in place, the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility.

5A(2)—The liner required by paragraph 5A(1) above must be—

(a) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

(b) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(c) Installed to cover all surrounding earth likely to be in contact with the wastes or leachate.

5A(3)—The applicant or licensee will be exempted from the requirements of paragraph 5A(1) of this criterion if the Commission finds, based on a demonstration by the applicant or licensee, that alternate design and operating practices, including the closure plan, together with site characteristics will prevent the migration of any hazardous constituents into ground water or surface water at any future time. In deciding whether to grant an exemption, the Commission will consider—

(a) The nature and quantity of the wastes;

(b) The proposed alternate design and operation;

(c) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and ground water or surface water; and

(d) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.

5A(4)—A surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations, overflowing, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error.

5A(5)—When dikes are used to form the surface impoundment, the dikes must be designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment.

5B(1)—Uranium and thorium byproduct materials must be managed to conform to the following secondary ground-water protection standard: Hazardous constituents entering the ground water from a licensed site must not exceed the specified concentration limits

in the uppermost aquifer beyond the point of compliance during the compliance period. Hazardous constituents are those constituents identified by the Commission pursuant to paragraph 5B(2) of this criterion. Specified concentration limits are those limits established by the Commission as indicated in paragraph 5B(5) of this criterion. The Commission will also establish the point of compliance and compliance period on a site specific basis through license conditions and orders. The objective in selecting the point of compliance is to provide the earliest practicable warning that the impoundment is releasing hazardous constituents to the ground water. The point of compliance must be selected to provide prompt indication of ground-water contamination on the hydraulically downgradient edge of the disposal area. The Commission shall identify hazardous constituents, establish concentration limits, set the compliance period, and may adjust the point of compliance if needed to accord with developed data and site information as to the flow of ground water or contaminants, when the detection monitoring established under Criterion 7A indicates leakage of hazardous constituents from the disposal area.

5B(2)—A constituent becomes a hazardous constituent subject to paragraph 5B(5) only when the constituent meets all three of the following tests:

(a) The constituent is reasonably expected to be in or derived from the byproduct material in the disposal area;

(b) The constituent has been detected in the ground water in the uppermost aquifer; and

(c) The constituent is listed in Criterion 13 of this appendix.

5B(3)—Even when constituents meet all three tests in paragraph 5B(2) of this criterion, the Commission may exclude a detected constituent from the set of hazardous constituents on a site specific basis if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. In deciding whether to exclude constituents, the Commission will consider the following:

(a) Potential adverse effects on ground-water quality, considering—

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

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

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

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

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

(vi) The existing quality of ground water, 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.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering—

- (i) The volume and physical and chemical characteristics of the waste in the licensed site;
- (ii) The hydrogeological characteristics of the facility and surrounding land;
- (iii) The quantity and quality of ground water, and the direction of ground-water flow;
- (iv) The patterns of rainfall in the region;
- (v) The proximity of the licensed site 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.

5B(4)—In making any determinations under paragraphs 5B(3) and 5B(6) of this criterion about the use of ground water in the area around the facility, the Commission will consider any identification of underground sources of drinking water and exempted aquifers made by the Environmental Protection Agency.

5B(5)—At the point of compliance, the concentration of a hazardous constituent must not exceed—

- (a) The Commission approved background concentration of that constituent in the ground water;
- (b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or
- (c) An alternate concentration limit established by the Commission.

5B(6)—Conceptually, background concentrations pose no incremental hazards and the drinking water limits in paragraph 5C state acceptable hazards but these two options may not be practically achievable at a specific site. Alternate concentration limits that present no significant hazard may be proposed by licensees for Commission consideration. Licensees must provide the basis for any proposed limits including consideration of practicable corrective actions, that limits are as low as reasonably achievable, and information on the factors the Commission must consider. The Commission will establish a site specific alternate concentration limit for a hazardous constituent as provided in paragraph 5B(5) of this criterion if it finds that the proposed limit is as low as reasonably achievable, after considering practicable corrective actions, and 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 making the present and potential hazard finding, the Commission will consider the following factors:

- (a) Potential adverse effects on ground-water quality, considering—
  - (i) The physical and chemical characteristics of the waste in the licensed site including its potential for migration;
  - (ii) The hydrogeological characteristics of the facility and surrounding land;
  - (iii) The quantity of ground water and the direction of ground-water flow;
  - (iv) The proximity and withdrawal rates of ground-water users;
  - (v) The current and future uses of ground water in the area;
  - (vi) The existing quality of ground water, 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.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering—

- (i) The volume and physical and chemical characteristics of the waste in the licensed site;
- (ii) The hydrogeological characteristics of the facility and surrounding land;
- (iii) The quantity and quality of ground water, and the direction of ground-water flow;
- (iv) The patterns of rainfall in the region;
- (v) The proximity of the licensed site 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.

5C—MAXIMUM VALUES FOR GROUND-WATER PROTECTION

Constituent or property	Maximum concentration
Milligrams per liter:	
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-dioxo-1,4,4a,5,6,7,8,9a-octahydro-1,4-benzodioxepin-2-one).....	0.0002

5C—MAXIMUM VALUES FOR GROUND-WATER PROTECTION—Continued

Constituent or property	Maximum concentration
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 <sub>10</sub> H <sub>10</sub> Cl <sub>8</sub> , Technical chlorinated camphene, 67-69 percent chlorine).....	0.005
2,4-D (2,4-Dichlorophenoxyacetic acid).....	0.1
2,4,5-TP Sivec (2,4,5-Trichlorophenoxypropionic acid).....	0.01
Picocuries per liter:	
Combined radium-226 and radium-228.....	5
Gross alpha-particle activity (excluding radon and uranium byproduct material or radon and thorium when producing thorium byproduct material).....	15

5D—If the ground-water protection standards established under paragraph 5B(1) of this criterion are exceeded at a licensed site, a corrective action program must be put into operation as soon as is practicable, and in no event later than eighteen (18) months after the Commission finds that the standards have been exceeded. The licensee shall submit the proposed corrective action program and supporting rationale for Commission approval prior to putting the program into operation, unless otherwise directed by the Commission. The objective of the program is to return hazardous constituent concentration levels in ground water to the concentration limits set as standards. The licensee's proposed program must address removing the hazardous constituents that have entered the ground water at the point of compliance or treating them in place. The program must also address removing or treating in place any hazardous constituents that exceed concentration limits in ground water between the point of compliance and the downgradient facility property boundary. The licensee shall continue corrective action measures to the extent necessary to achieve and maintain compliance with the ground-water protection standard. The Commission will determine when the licensee may terminate corrective action measures based on data from the ground-water monitoring program and other information that provide reasonable assurance that the ground-water protection standard will not be exceeded.

5E—In developing and conducting ground-water protection programs, applicants and licensees shall also consider the following:

- (1) Installation of bottom liners (Where synthetic liners are used, a leakage detection system must be installed immediately below the liner to ensure major failures are detected

if they occur. This is in addition to the ground-water monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ clay soils are to be relied upon for seepage control, tests must be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests must be run for a sufficient period of time to reveal any effects if they are going to occur [in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure].

(2) Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.

(3) Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings must be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head of seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom must be graded to assure that the drains are at a low point. The drains must be protected by suitable filter materials to assure that drains remain free running. The drainage system must also be adequately sized to assure good drainage).

(4) Neutralization to promote immobilization of hazardous constituents.

5F—Where ground-water impacts are occurring at an existing site due to seepage, action must be taken to alleviate conditions that lead to excessive seepage impacts and restore ground-water quality. The specific seepage control and ground-water protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications must be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, must be established to assure the specifications are met.

5C.—In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

- (1) The chemical and radioactive characteristics of the waste solutions.
- (2) The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This includes detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations must be determined. This information must be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to ground water. The information gathered on boreholes must include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channelled deposits of high hydraulic

conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic parameters such as permeability may not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) must be conducted to assure actual field properties are adequately understood. Testing must be conducted to allow estimating chemisorption/attenuation properties of underlying soil and rock.

(3) Location, extent, quality, capacity and current uses of any ground water at and near the site.

5H—Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

4. Criterion 6 is amended by adding the following new paragraph at the end of Criterion 6:

Criterion 6— \* \* \*

The licensee shall also address the nonradiological hazards associated with the wastes in planning and implementing closure. The licensee shall ensure that disposal areas are closed in a manner that minimizes the need for further maintenance. To the extent necessary to prevent threats to human health and the environment, the licensee shall control, minimize, or eliminate post-closure escape of nonradiological hazardous constituents, leachate, contaminated rainwater, or waste decomposition products to the ground or surface waters or to the atmosphere.

5. Criterion 7 is amended by adding the following new paragraph at the end of Criterion 7:

Criterion 7— \* \* \*

7A—The licensee shall establish a detection monitoring program needed for the Commission to set the site-specific ground-water protection standards in paragraph 5B(1) of this appendix. For all monitoring under this paragraph the licensee or applicant will propose for Commission approval as license conditions which constituents are to be monitored on a site specific basis. A detection monitoring program has two purposes. The initial purpose of the program is to detect leakage of hazardous constituents from the disposal area so that the need to set ground-water protection standards is monitored. If leakage is detected, the second purpose of the program is to generate data and information needed for the Commission to establish the standards under Criterion 5B. The data and information must provide a sufficient basis to identify those hazardous constituents which require concentration limit standards and to enable the Commission to set the limits for those constituents and the compliance period. They may also need to provide the basis for adjustments to the point of compliance. For licenses in effect September 30, 1983, the detection monitoring programs must have been in place by October 1, 1984. For licenses issued after September 30, 1983, the detection monitoring programs must be in place when specified by the Commission in orders or

license conditions. Once ground-water protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to determine that the hazardous constituent concentrations in ground water continue to comply with the standards set by the Commission. In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions. Any monitoring program required by this paragraph may be based on existing monitoring programs to the extent the existing programs can meet the stated objective for the program.

6. Add the following new heading and a new Criterion 13 at the end of Appendix A to read as follows:

#### V. Hazardous Constituents

Criterion 13—Secondary ground-water protection standards required by Criterion 5 of this appendix are concentration limits for individual hazardous constituents. The following list of constituents identifies the constituents for which standards must be set and complied with if the specific constituent is reasonably expected to be in or derived from the byproduct material and has been detected in ground water. For purposes of this Appendix, the property of gross alpha activity will be treated as if it is a hazardous constituent. Thus, when setting standards under paragraph 5B(5) of Criterion 5, the Commission will also set a limit for gross alpha activity. The Commission does not consider the following list imposed by 40 CFR Part 192 to be exhaustive and may determine other constituents to be hazardous on a case-by-case basis, independent of those specified by the U.S. Environmental Protection Agency in Part 192.

#### Hazardous Constituents

Acetonitrile (Ethanitrile)  
 Acetophenone (Ethanone, 1-phenyl)  
 3-(alpha-Acetylbenzyl)-4-hydroxycoumarin and salts (Warfarin)  
 2-Acetylaminofluorene (Acetamide, N-(9H-fluoren-2-yl)-)  
 Acetyl chloride (Ethanoyl chloride)  
 1-Acetyl-2-thiourea (Acetamide, N-(aminothioxomethyl)-)  
 Acrolein (2-Propenal)  
 Acrylamide (2-Propenamide)  
 Acrylonitrile (2-Propenenitrile)  
 Aflatoxins  
 Aldrin [1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a,8b-hexahydro-endo, exo-1,4:5,8-Dimethanonaphthalene]  
 Allyl alcohol (2-Propen-1-ol)  
 Aluminum phosphide  
 4-Aminobiphenyl ([1,1'-Biphenyl]-4-amine)  
 6-Amino-1,1a,2,2a,8a,8b-hexahydro-6-(hydroxymethyl)-8a-methoxy-5-methylcarbamate azirino[2,3':3,4]pyrrolo[1,2-a]indole-4,7-dione, (ester) (Mitomycin C) (Azirino[2,3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-6-((amino-

- carbonyloxy)methyl] 1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl)
- 5-[Aminomethyl]-3-isoxazolol [3(2H)-isoxazolone, 5-(aminomethyl)-] 4-Aminopyridine (4-Pyridinamine)
- Amitrole (1H-1,2,4-Triazol-3-amine)
- Anilins (Benzenamine)
- Antimony and compounds, N.O.S.<sup>3</sup>
- Arsenite (Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl) phenoxy]-1-methylethyl ester)
- Arsenic and compounds, N.O.S.<sup>3</sup>
- Arsenic acid (Orthoarsenic acid)
- Arsenic pentoxide (Arsenic (V) oxide)
- Arsenic trioxide (Arsenic (III) oxide)
- Auramine (Benzenamine, 4,4'-carbonimidoylbis[N,N-Dimethyl-, monohydrochloride])
- Azaserine (L-Serine, diazoacetate (ester))
- Barium and compounds, N.O.S.<sup>3</sup>
- Barium cyanide
- Benz[e]acridine (3,4-Benzacridine)
- Benz[a]anthracene (1,2-Benzanthracene)
- Benzene (Cyclohexatriene)
- Benzenearsonic acid (Arsenic acid, phenyl-)
- Benzene, dichloromethyl- (Benzal chloride)
- Benzenethiol (Thiophenol)
- Benzidine ([1,1'-Biphenyl]-4,4'-diamine)
- Benzo[b]fluoranthene (2,3-Benzofluoranthene)
- Benzo[j]fluoranthene (7,8-Benzofluoranthene)
- Benzo[a]pyrene (3,4-Benzopyrene)
- p-Benzoquinone (1,4-Cyclohexa-2,5-dione)
- Benzotrichloride (Benzene, trichloromethyl)
- Benzyl chloride (Benzene, (chloromethyl)-)
- Beryllium and compounds, N.O.S.<sup>3</sup>
- Bis(2-chloroethoxy)methane (Ethane, 1,1'-(methylenebis(oxy))bis[2-chloro-])
- Bis(2-chloroethyl) ether (Ethane, 1,1'-oxybis[2-chloro-])
- N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine)
- Bis(2-chloroisopropyl) ether (Propane, 2,2'-oxybis[2-chloro-])
- Bis(chloromethyl) ether (Methane, oxybis[chloro-])
- Bis(2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester)
- Bromoacetone (2-Propanone, 1-bromo-)
- Bromomethane (Methyl bromide)
- 4-Bromophenyl phenyl ether (Benzene, 1-bromo-4-phenoxy-)
- Brucine (Strychnidin-10-one, 2,3-dimethoxy-)
- 2-Butanone peroxide (Methyl ethyl ketone, peroxide)
- Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)
- 2-sec-Butyl-4,6-dinitrophenol (DNBP) (Phenol, 2,4-dinitro-6-(1-methylpropyl)-)
- Cadmium and compounds, N.O.S.<sup>3</sup>
- Calcium chromate (Chromic acid, calcium salt)
- Calcium cyanide
- Carbon disulfide (Carbon bisulfide)
- Carbon oxyfluoride (Carbonyl fluoride)
- Chloral (Acetaldehyde, trichloro-)
- Chlorambucil (Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-)
- Chlordane (alpha and gamma isomers) [4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3,4,7,8-tetrahydro-] (alpha and gamma isomers)
- Chlorinated benzenes, N.O.S.<sup>3</sup>
- Chlorinated ethane, N.O.S.<sup>3</sup>
- Chlorinated fluorocarbons, N.O.S.<sup>3</sup>
- Chlorinated naphthalene, N.O.S.<sup>3</sup>
- Chlorinated phenol, N.O.S.<sup>3</sup>
- Chloroacetaldehyde (Acetaldehyde, chloro-)
- Chloroalkyl ethers, N.O.S.<sup>3</sup>
- p-Chloroaniline (Benzenamine, 4-chloro-)
- Chlorobenzene (Benzene, chloro-)
- Chlorobenzilate (Benzenoacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester)
- p-Chloro-m-cresol (Phenol, 4-chloro-3-methyl)
- 1-Chloro-2,3-epoxypropane (Oxirane, 2-(chloromethyl)-)
- 2-Chloroethyl vinyl ether (Ethene, (2-chloroethoxy)-)
- Chloroform (Methane, trichloro-)
- Chloromethane (Methyl chloride)
- Chloromethyl methyl ether (Methane, chloromethoxy-)
- 2-Chloronaphthalene (Naphthalene, 1,6-chloro-)
- 1-Chlorophenol (Phenol, o-chloro-)
- 1-(o-Chlorophenyl)thiourea (Thiourea, (2-chlorophenyl)-)
- 3-Chloropropionitrile (Propanenitrile, 3-chloro-)
- Chromium and compounds, N.O.S.<sup>3</sup>
- Chrysene (1,2-Benzphenanthrene)
- Citrus red No. 2 (2-Naphthol, 1-[(2,5-dimethoxyphenyl)azo]-)
- Coal tars
- Copper cyanide
- Creosote (Creosote, wood)
- Creosols (Cresylic acid) (Phenol, methyl-)
- Crotonaldehyde (2-Butenal)
- Cyanides (soluble salts and complexes), N.O.S.<sup>3</sup>
- Cyanogen (Ethanedinitrile)
- Cyanogen bromide (Bromine cyanide)
- Cyanogen chloride (Chlorine cyanide)
- Cycasin (beta-D-Glucopyranoside, (methyl-ONN-azoxy)methyl-)
- 2-Cyclohexyl-4,6-dinitrophenol (Phenol, 2-cyclohexyl-4,6-dinitro-)
- Cyclophosphamide (2H-1,3,2-Oxazaphosphorine, [bis(2-chloroethyl)amino]-tetrahydro-2-oxide)
- Dauromycin (5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl]oxy)-7,8,9,10-tetrahydro-8,8,11-trihydroxy-1-methoxy-)
- DDD (Dichlorodiphenyldichloroethane) (Ethane, 1,1-dichloro-2,2-bis(p-chlorophenyl)-)
- DDE (Ethylene, 1,1-dichloro-2,2-bis(4-chlorophenyl)-)
- DDT (Dichlorodiphenyltrichloroethane) (Ethane, 1,1,1-trichloro-2,2-bis(4-chlorophenyl)-)
- Diallate (S-(2,3-dichloroallyl) diisopropylthiocarbamate)
- Dibenz[a,h]acridine (1,2,5,6-Dibenzacridine)
- Dibenz[a,j]acridine (1,2,7,8-Dibenzacridine)
- Dibenz[a,h]anthracene (1,2,5,6-Dibenzanthracene)
- 7H-Dibenzo[c,g]carbazole (3,4,5,6-Dibenzcarbazole)
- Dibenzo[a,e]pyrene (1,2,4,5-Dibenzpyrene)
- Dibenzo[a,h]pyrene (1,2,5,6-Dibenzpyrene)
- Dibenzo[a,i]pyrene (1,2,7,8-Dibenzpyrene)
- 1,2-Dibromo-3-chloropropane (Propane, 1,2-dibromo-3-chloro-)
- 1,2-Dibromoethane (Ethylene dibromide)
- Dibromomethane (Methylene bromide)
- Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)
- o-Dichlorobenzene (Benzene, 1,2-dichloro-)
- m-Dichlorobenzene (Benzene, 1,3-dichloro-)
- p-Dichlorobenzene (Benzene, 1,4-dichloro-)
- Dichlorobenzene, N.O.S.<sup>3</sup> (Benzene, dichloro-, N.O.S.<sup>3</sup>)
- 3,3'-Dichlorobenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-)
- 1,4-Dichloro-2-butene (2-Butene, 1,4-dichloro-)
- Dichlorodifluoromethane (Methane, dichlorodifluoro-)
- 1,1-Dichloroethane (Ethylidene dichloride)
- 1,2-Dichloroethane (Ethylene dichloride)
- trans-1,2-Dichloroethene (1,2-Dichloroethylene)
- Dichloroethylene, N.O.S.<sup>3</sup> (Ethene, dichloro-, N.O.S.<sup>3</sup>)
- 1,1-Dichloroethylene (Ethene, 1,1-dichloro-)
- Dichloromethane (Methylene chloride)
- 2,4-Dichlorophenol (Phenol, 2,4-dichloro-)
- 2,6-Dichlorophenol (Phenol, 2,6-dichloro-)
- 2,4-Dichlorophenoxyacetic acid (2,4-D), salts and esters (Acetic acid, 2,4-dichlorophenoxy-, salts and esters)
- Dichlorophenylarsine (Phenyl dichloroarsine)
- Dichloropropane, N.O.S.<sup>3</sup> (Propane, dichloro-, N.O.S.<sup>3</sup>)
- 1,2-Dichloropropane (Propylene dichloride)
- Dichloropropanol, N.O.S.<sup>3</sup> (Propanol, dichloro-, N.O.S.<sup>3</sup>)
- Dichloropropene, N.O.S.<sup>3</sup> (Propene, dichloro-, N.O.S.<sup>3</sup>)
- 1,3-Dichloropropene (1-Propene, 1,3-dichloro-)
- Dieldrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,8a,5,6,7,8,8a-octa-hydro-endo, exo-1,4,5,8-Dimethanonaphthalene)
- 1,2:3,4-Diepoxybutane (2,2'-Bioxirane)
- Diethylarsine (Arsine, diethyl-)
- N,N-Diethylhydrazine (Hydrazine, 1,2-diethyl)
- O,O-Diethyl S-methyl ester of phosphorodithioic acid (Phosphorodithioic acid, O,O-diethyl S-methyl ester)
- O,O-Diethylphosphoric acid, O-p-nitrophenyl ester (Phosphoric acid, diethyl p-nitrophenyl ester)
- Diethyl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)
- O,O-Diethyl O-2-pyrazinyl phosphorothioate (Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester)
- Diethylstilbestrol (4,4'-Stilbenediol, alpha, alpha-diethyl, bis(dihydrogen phosphate, (E)-)
- Dihydroaafrole (Benzene, 1,2-methylenedioxy-4-propyl-)
- 3,4-Dihydroxy-alpha-(methylamino)methyl benzyl alcohol (1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-)
- Diisopropylfluorophosphate (DFF) (Phosphorofluoric acid, bis(1-methylethyl) ester)
- Dimethoate (Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester)
- 3,3'-Dimethoxybenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-)
- p-Dimethylaminoazobenzene (Benzenamine, N,N-dimethyl-4-(phenylazo)-)
- 7,12-Dimethylbenz[a]anthracene (1,2-Benzanthracene, 7,12-dimethyl-)

<sup>3</sup> The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this list.

- 3,3-Dimethylbenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3-dimethyl-)
- Dimethylcarbamoyl chloride (Carbamoyl chloride, dimethyl-)
- 1,1-Dimethylhydrazine (Hydrazine, 1,1-dimethyl-)
- 1,2-Dimethylhydrazine (Hydrazine, 1,2-dimethyl-)
- 3,3-Dimethyl-1-(methylthio)-2-butanone, O-[[methylamino]carbonyl]oxime (Thiofanox)
- alpha.alpha-Dimethylphenethylamine (Ethanamine, 1,1-dimethyl-2-phenyl-)
- 2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)
- Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)
- Dimethyl sulfate (Sulfuric acid, dimethyl ester)
- D,nitrobenzene, N.O.S.<sup>2</sup> (Benzene, dinitro-, N.O.S.<sup>2</sup>)
- 4,6-Dinitro-o-cresol and salts (Phenol, 2,4-dinitro-6-methyl-, and salts)
- 2,4-Dinitrophenol (Phenol, 2,4-dinitro-)
- 2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)
- 2,6-Dinitrotoluene (Benzene, 1-methyl-2,6-dinitro-)
- Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)
- 1,4-Dioxane (1,4-Diethylene oxide)
- Diphenylamine (Benzenamine, N-phenyl-)
- 1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)
- Di-n-propylnitrosamine (N-Nitroso-di-n-propylamine)
- Disulfoton (O,O-diethyl S-[2-(ethylthio)ethyl]phosphorodithioate)
- 2,4-Dithiobiuret (Thioimidodicarbonic diamide)
- Endosulfan (5-Norbornene, 2,3-dimethanol, 1,4,5,6,7,7-hexachloro-, cyclic sulfite)
- Endrin and metabolites (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo-endo-1,4,5,8-dimethanonaphthalene, and metabolites)
- Ethyl carbamate (Urethan) (Carbamic acid, ethyl ester)
- Ethyl cyanide (propanenitrile)
- Ethylenebisdithiocarbamic acid, salts and esters (1,2-Ethanediy-biscarbamodithionic acid, salts and esters)
- Ethyleneimine (Aziridine)
- Ethylene oxide (Oxirane)
- Ethylenethiourea (2-Imidazolidinethione)
- Ethyl methacrylate (2-Propenoic acid, 2-methyl-, ethyl ester)
- Ethyl methanesulfonate (Methanesulfonic acid, ethyl ester)
- Fluoranthene (Benzo[j,k]fluorene)
- Fluorine
- 2-Fluoroacetamide (Acetamide, 2-fluoro-)
- Fluoroacetic acid, sodium salt (Acetic acid, fluoro-, sodium salt)
- Formaldehyde (Methylene oxide)
- Formic acid (Methanoic acid)
- Glycidylaldehyde (1-Propanol-2,3-epoxy)
- Halomethane, N.O.S.<sup>2</sup>
- Heptachlor (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-)
- Heptachlor epoxide (alpha, beta, and gamma isomers) (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7-tetrahydro-, alpha, beta, and gamma isomers)
- Hexachlorobenzene (Benzene, hexachloro-)
- Hexachlorobutadiene (1,3-Butadiene, 1,1,2,3,4,4-hexachloro-)
- Hexachlorocyclohexane (all isomers) (Lindane and isomers)
- Hexachlorocyclopentadiene (1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-)
- Hexachloroethane (Ethane, 1,1,1,2,2,2-hexachloro-)
- 1,2,3,4,10,10-Hexachloro-1,4,4a,5,6,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene (Hexachlorohexahydro-endo,endo-dimethanonaphthalene)
- Hexachlorophene (2,2'-Methylenebis(3,4,6-trichlorophenol))
- Hexachloropropene (1-Propene, 1,1,2,3,3,3-hexachloro-)
- Hexaethyl tetraphosphate (Tetraphosphoric acid, hexaethyl ester)
- Hydrazine (Diamine)
- Hydrocyanic acid (Hydrogen cyanide)
- Hydrofluoric acid (Hydrogen fluoride)
- Hydrogen sulfide (Sulfur hydride)
- Hydroxydimethylarsine oxide (Cacodylic acid)
- Indeno (1,2,3-cd)pyrene (1,10-(1,2-phenylene)pyrene)
- Iodomethane (Methyl iodide)
- Iron dextran (Ferric dextran)
- Isocyanic acid, methyl ester (Methyl isocyanate)
- Isobutyl alcohol (1-Propanol, 2-methyl-)
- Isosafrole (Benzene, 1,2-methylenedioxy-4-allyl-)
- Kepone (Decachlorooctahydro-1,3,4-Methano-2H-cyclobuta[cd]pentalen-2-one)
- Lasiocarpine (2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester)
- Lead and compounds, N.O.S.<sup>2</sup>
- Lead acetate (Acetic acid, lead salt)
- Lead phosphate (Phosphoric acid, lead salt)
- Lead subacetate (Lead, bis(acetato-0)tetrahydroxytri-)
- Maleic anhydride (2,5-Furandione)
- Maleic hydrazide (1,2-Dihydro-3,6-pyridazinedione)
- Malononitrile (Propanedinitrile)
- Melphalan (Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-L-)
- Mercury fulminate (Fulminic acid, mercury salt)
- Mercury and compounds, N.O.S.<sup>2</sup>
- Methacrylonitrile (2-Propenenitrile, 2-methyl-)
- Methanethiol (Thiomethanol)
- Methapyrilene (Pyridine, 2-[[2-dimethylamino)ethyl]-2-thenylamino-)
- Metholmyl (Acetimidic acid, N-[[methylcarbamoyl]oxy]thio-, methyl ester)
- Methoxychlor (Ethane, 1,1,1-trichloro-2,2'-bis(p-methoxyphenyl)-)
- 2-Methylaziridine (1,2-Propylenimine)
- 3-Methylcholanthrene (Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-)
- Methyl chlorocarbonate (Carbonochloridic acid, methyl ester)
- 4,4'-Methylenebis(2-chloroaniline) (Benzenamine, 4,4'-methylenebis-(2-chloro-))
- Methyl ethyl ketone (MEK) (2-Butanone)
- Methyl hydrazine (Hydrazine, methyl-)
- 2-Methylacetonitrile (Propanenitrile, 2-hydroxy-2-methyl-)
- Methyl methacrylate (2-Propenoic acid, 2-methyl-, methyl ester)
- Methyl methanesulfonate (Methanesulfonic acid, methyl ester)
- 2-Methyl-2-(methylthio)propionaldehyde-o-(methylcarbamoyl)oxime (Propanal, 2-methyl-2-(methylthio)-, O-[[methylamino]carbonyl]oxime)
- N Methyl-N'-nitro-N-nitrosoguanidine (Guanidine, N-nitroso-N-methyl-N'-nitro-)
- Methyl parathion (0,0-dimethyl O-(4-nitrophenyl) phosphorothioate)
- Methylthioureacil (4-ih-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-)
- Molybdenum and compounds, N.O.S.<sup>2</sup>
- Mustard gas (Sulfide, bis(2-chloroethyl)-)
- Naphthalene
- 1,4-Naphthoquinone (1,4-Naphthalenedione)
- 1-Naphthylamine (alpha-Naphthylamine)
- 2-Naphthylamine (beta-Naphthylamine)
- 1-Naphthyl-2-thiourea (Thiourea, 1-naphthyl-2-yl-)
- Nickel and compounds, N.O.S.<sup>2</sup>
- Nickel carbonyl (Nickel tetracarbonyl)
- Nickel cyanide (Nickel (II) cyanide)
- Nicotine and salts (Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts)
- Nitric oxide (Nitrogen (II) oxide)
- p-Nitroaniline (Benzenamine, 4-nitro-)
- Nitrobenzene (Benzene, nitro-)
- Nitrogen dioxide (Nitrogen (IV) oxide)
- Nitrogen mustard and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt)
- Nitrogen mustard N-Oxide and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt)
- Nitroglycerine (1,2,3-Propanetri-yl, trinitrate)
- 4-Nitrophenol (Phenol, 4-nitro-)
- 4-Nitroquinoline-1-oxide (Quinoline, 4-nitro-1-oxide-)
- Nitrosamine, N.O.S.<sup>2</sup>
- N-Nitrosodi-n-butylamine (1-Butanamine, N-butyl-N-nitroso-)
- N-Nitrosodiethanolamine (Ethanol, 2,2'-(nitrosoimino)bis-)
- N-Nitrosodiethylamine (Ethanamine, N-ethyl-N-nitroso-)
- N-Nitrosodimethylamine (Dimethylnitrosamine)
- N-Nitroso-N-ethylurea (Carbamide, N-ethyl-N-nitroso-)
- N-Nitrosomethylethylamine (Ethanamine, N-methyl-N-nitroso-)
- N-Nitroso-N-methylurea (Carbamide, N-methyl-N-nitroso-)
- N-Nitroso-N-methylurethane (Carbamic acid, methylnitroso-, ethyl ester)
- N-Nitrosomethylvinylamine (Ethanamine, N-methyl-N-nitroso-)
- N-Nitrosomorpholine (Morpholine, N-nitroso-)
- N-Nitrososarcosine (Sarcosine, N-nitroso-)
- N-Nitrososomnicotine (Nicotine, N-nitroso-)
- N-Nitrosopiperidine (Pyridine, hexahydro-, N-nitroso-)
- Nitrosopyrrolidine (Pyrrole, tetrahydro-, N-nitroso-)
- N-Nitrososarcosine (Sarcosine, N-nitroso-)
- 5-Nitro-o-toluidine (Benzenamine, 2-methyl-5-nitro-)
- Octamethylpyrophosphoramide (Diphosphoramide, octamethyl-)
- Osmium tetroxide (Osmium (VIII) oxide)
- 7-Oxabicyclo[2.2.1]heptane-2,5-dicarboxylic acid (Endothal)



Paraldehyde (1,3,5-Trioxane, 2,4,6-trimethyl-)  
 Parathion (Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl)ester)  
 Pentachlorobenzene (Benzene, pentachloro-)  
 Pentachloroethane (Ethane, pentachloro-)  
 Pentachloronitrobenzene (PCNB) (Benzene, pentachloronitro-)  
 Pentachlorophenol (Phenol, pentachloro-)  
 Phenacetin (Acetamide, N-(4-ethoxyphenyl)-)  
 Phenol (Benzene, hydroxy-)  
 Phenylendiamine (Benzenediamine)  
 Phenylmercury acetate (Mercury, acetatophenyl-)  
 N-Phenylthiourea (Thiourea, phenyl-)  
 Phosgene (Carbonyl chloride)  
 Phosphine (Hydrogen phosphide)  
 Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester (Phorate)  
 Phosphorothioic acid, O,O-dimethyl O-[p-[(dimethylamino)sulfonyl]phenyl] ester (Famphur)  
 Phthalic acid esters, N.O.S.<sup>2</sup> (Benzene, 1,2-dicarboxylic acid, esters, N.O.S.<sup>2</sup>)  
 Phthalic anhydride (1,2-Benzenedicarboxylic acid anhydride)  
 2-Picoline (Pyridine, 2-methyl-)  
 Polychlorinated biphenyl, N.O.S.<sup>2</sup>  
 Potassium cyanide  
 Potassium silver cyanide (Argentatell-, dicyano-, potassium)  
 Pronamide (3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide)  
 1,3-Propane sultone (1,2-Oxathiolane, 2,2-dioxide)  
 n-Propylamine (1-Propanamine)  
 Propylthiouracil (Undecamethylenediamine, N,N-bis(2-chlorobenzyl-), dihydrochloride)  
 2-Propyn-1-ol (Propargyl alcohol)  
 Pyridine  
 Radium -226 and -228  
 Reserpine (Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[3,4,5-trimethoxybenzoyloxy]-, methyl ester)  
 Resorcinol (1,3-Benzenediol)  
 Saccharin and salts (1,2-Benzothiazolin-3-one, 1,1-dioxide, and salts)  
 Saffrole (Benzene, 1,2-methylenedioxy-4-allyl-)  
 Selenious acid (Selenium dioxide)  
 Selenium and compounds, N.O.S.<sup>2</sup>  
 Selenium sulfide (Sulfur selenide)  
 Selenourea (Carbamimidoseleonic acid)  
 Silver and compounds, N.O.S.<sup>2</sup>  
 Silver cyanide  
 Sodium cyanide  
 Streptozolacin (D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-)  
 Strontium sulfide  
 Strychnine and salts (Strychnidin-10-one, and salts)  
 1,2,4,5-Tetrachlorobenzene (Benzene, 1,2,4,5-tetrachloro-)  
 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (Dibenzo-p-dioxin, 2,3,7,8-tetrachloro-)  
 Tetrachloroethane, N.O.S.<sup>2</sup> (Ethane, tetrachloro-, N.O.S.<sup>2</sup>)  
 1,1,1,2-Tetrachloroethane (Ethane, 1,1,1,2-tetrachloro-)  
 1,1,1,2-Tetrachloroethane (Ethane, 1,1,1,2-tetrachloro-)  
 Tetrachloroethane (Ethane, 1,1,2,2-tetrachloro-)  
 Tetrachloromethane (Carbon tetrachloride)  
 2,3,4,6-Tetrachlorophenol (Phenol, 2,3,4,6-tetrachloro-)

Tetraethylthiopyrophosphate (Dithiopyrophosphoric acid, tetraethyl-ester)  
 Tetraethyl lead (Pbmbane, tetraethyl-)  
 Tetraethylpyrophosphate (Pyrophosphoric acid, tetraethyl ester)  
 Tetranitromethane (Methane, tetranitro-)  
 Thallium and compounds, N.O.S.<sup>2</sup>  
 Thalic oxide (Thallium (III) oxide)  
 Thallium (I) acetate (Acetic acid, thallium (I) salt)  
 Thallium (I) carbonate (Carbonic acid, thallium (I) salt)  
 Thallium (I) chloride  
 Thallium (I) nitrate (Nitric acid, thallium (I) salt)  
 Thallium selenite  
 Thallium (I) sulfate (Sulfuric acid, thallium (I) salt)  
 Thioacetamide (Ethanethioamide)  
 Thiosemicarbazide (Hydrazinecarbothioamide)  
 Thiourea (Carbamide thio-)  
 Thiuram (Bis(dimethylthiocarbonyl) disulfide)  
 Thorium and compounds, N.O.S.<sup>2</sup> when producing thorium byproduct material  
 Toluene (Benzene, methyl-)  
 Toluenediamine (Diaminotoluene)  
 o-Toluidine hydrochloride (Benzenamine, 2-methyl-, hydrochloride)  
 Toluene dicyanate (Benzene, 1,3-dicyanatomethyl-)  
 Toxaphene (Camphene, octachloro-)  
 Tribromomethane (Bromofom)  
 1,2,4-Trichlorobenzene (Benzene, 1,2,4-trichloro-)  
 1,1,1-Trichloroethane (Methyl chloroform)  
 1,1,2-Trichloroethane (Ethane, 1,1,2-trichloro-)  
 Trichloroethene (Trichloroethylene)  
 Trichloromethane (Methane, trichloro-)  
 Trichloromonofluoromethane (Methane, trichlorofluoro-)  
 2,4,5-Trichlorophenol (Phenol, 2,4,5-trichloro-)  
 2,4,6-Trichlorophenol (Phenol, 2,4,6-trichloro-)  
 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) (Acetic acid, 2,4,5-trichlorophenoxy-)  
 2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP) (Silvex) (Propionic acid, 2-(2,4,5-trichlorophenoxy)-)  
 Trichloropropane, N.O.S.<sup>2</sup> (Propane, trichloro-, N.O.S.<sup>2</sup>)  
 1,2,3-Trichloropropane (Propane, 1,2,3-trichloro-)  
 O,O,O-Triethyl phosphorothioate (Phosphorothioic acid, O,O,O-triethyl ester)  
 sym-Trinitrobenzene (Benzene, 1,3,5-trinitro-)  
 Tris(1-aziridinyl) phosphine sulfide (Phosphine sulfide, tris(1-aziridinyl) )  
 Tris(2,3-dibromopropyl) phosphate (1-Propanol, 2,3-dibromo-, phosphate)  
 Trypan blue (2,7-Naphthalenedisulfonic acid, 3,3'-(3,3'-dimethyl 1,1'-biphenyl)-4,4'-diyl)bis(azo)bis(5-amino-4-hydroxy-, tetrasodium salt)  
 Uracil mustard (Uracil 5-bis(2-chloroethyl)amino-)  
 Uranium and compounds, N.O.S.<sup>2</sup>  
 Vanadic acid, ammonium salt (ammonium vanadate)  
 Vanadium pentoxide (Vanadium (V) oxide)  
 Vinyl chloride (Ethene, chloro-)  
 Zinc cyanide  
 Zinc phosphide

Dated at Washington, DC this 6th day of November, 1987.

For the Nuclear Regulatory Commission:  
 Samuel J. Chilk,  
 Secretary of the Commission.  
 [FR Doc. 87-28169 Filed 11-12-87; 8:45 am]  
 BILLING CODE 7590-01-M

## NATIONAL CREDIT UNION ADMINISTRATION

### 12 CFR Parts 701, 703, and 721

#### Organization and Operations of Federal Credit Unions; Investment and Deposit Activities; and Federal Credit Union Insurance and Group Purchasing Activities

AGENCY: National Credit Union Administration.

ACTION: Final rule.

**SUMMARY:** The NCUA Board is amending its regulations on Investments in and Loans to Credit Union Service Organizations (12 CFR 701.27), FCU Ownership of Fixed Assets (12 CFR 701.36), Investment and Deposit Activities (12 CFR Part 703), and Federal Credit Union Insurance and Group Purchasing Activities (12 CFR Part 721) by revising the definition of the term "immediate family members" as used therein and by adding a new definition, "senior management employee," to those provisions of its regulations. The purpose of these changes is to narrow the scope of the rules as they relate to potential conflicts of interest by credit union directors, committee members, employees, and their immediate family members. This will provide consistency between these regulations and the final rule on member business loans issued by the NCUA Board on April 9, 1987.

**EFFECTIVE DATE:** December 16, 1987.

**ADDRESS:** National Credit Union Administration, 1776 G Street NW., Washington, DC 20456.

**FOR FURTHER INFORMATION CONTACT:** James J. Engel, Deputy General Counsel, at the above address or telephone: (202) 357-1030.

#### SUPPLEMENTARY INFORMATION:

##### Background

On July 15, 1987, the NCUA Board issued proposed rules relating to conflicts of interest by credit union directors, committee members, employees, and their immediate family members. See, 52 FR 28274 (July 29, 1987). The rules were proposed to provide consistency between the final rule on member business loans (April 9, 1987) and NCUA's rules for Federal credit unions on credit union service organizations (CUSOs); ownership of

# APPENDIX C

Excerpt from 10 CFR Part 61 Notice  
Sample  
Regulatory Flexibility Analysis

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

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

#### Employee Protection

A new 10 CFR 81.9 has been added concerning job protection for employees who provide information to the Commission. The new section is included in the final rulemaking to carry out the Commission's intent that all specific licensees will have similar responsibilities under its employee protection regulations. See the Federal Register notice (47 FR 30452) dated July 14, 1982 for the basis for this action.

New 10 CFR 81.9 emphasizes to employers—that is, licensees, applicants, and their contractors and subcontractors—that termination or other acts of job discrimination against employees who engage in activities furthering the purposes of the Atomic Energy Act and the Energy Reorganization Act is prohibited. In addition, new 10 CFR 81.9 makes the employee aware that if discrimination of this nature is believed to have occurred, a remedy is available through the Wage and Hour Division of the Department of Labor. To ensure that employees of licensees and applicants are aware of these amendments, these organizations are required to post their premises with explanatory material related to the prohibition of discrimination and availability of a remedy in the event of discrimination.

#### Paperwork Reduction Act

As required by the Paperwork Reduction Act, Pub. L. 96-311, the recordkeeping and reporting requirements in the proposed amendments to 10 CFR 20 incorporated in the 10 CFR 81 rulemaking were submitted to the Office of Management and Budget and were approved. The proposed amendments to 10 CFR Part 20 were not significantly altered as a result of public comments so that approval remains valid. The application, reporting, and recordkeeping requirements contained in 10 CFR 81 apply only to land disposal facility operators and affect fewer than 10 persons and, therefore, are not subject to OMB clearance.

#### Regulatory Flexibility Act

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

The Regulatory Flexibility Act (Pub. L. 96-345) was signed into law in September 1980. The Act's principal objective is to make certain that Federal agencies try, where possible, to fit regulatory requirements to the scale of the affected activity. Significant economic impacts on a substantial number of small entities is a major concern. Part 81 and accompanying rule changes will potentially impact a significant number of persons licensed by the Commission and the Agreement States. The following discussion addresses the factors in the analyses required by the Act and the public comments received. The draft and final EIS's for Part 81 provide additional background information and analysis of the impacts of this rulemaking action.

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

Section 609 of the Regulatory Flexibility Act requires that small entities have an opportunity to participate in the rulemaking when the rule will have a significant economic impact on a substantial number. Since the Commission's initial certification of no significant impact was a qualified one, special efforts to reach small entities were made. For example, the proposed rule was distributed to all Commission licensees (9,000) and made available to Agreement States (12,000 licensees) with a cover letter highlighting the points that might impact them. Comments were solicited from groups such as the Health Physics Society, a national organization of professionals concerned with radiation safety, many of whose members will have to prepare manifests and coordinate compliance with the rule. The Health Physics Society publicized the rule in its newsletters to members. Of some 107 different commenters responding, none specifically addressed

the Regulatory Flexibility Act or the summary analysis. One utility (which is not a small entity) did make a general qualitative reference to burdens on small entities. Twelve commenters representing a variety of sectors (not just small entities) addressed the potential burden of the manifest system.

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

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

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

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

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

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

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

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

The Regulatory Flexibility Act also requires discussion of alternatives to the proposed action. The recordkeeping and

reporting requirements impose such a minor incremental burden that no exemption was considered. Initial estimates were that about 2,000 of the Commission's 9,000 licensees are waste generators who might make waste shipments. Waste generators must provide more complete information on the manifest than is currently required to meet DOT shipping paper requirements and must report on investigations of missing shipments. The additional information required in the manifest includes the identities of solidification agents; presence of any chelating agents; whether the waste is Class A, B, or C; and the total quantity of H-3, C-14, Tc-99, and I-129. The annual public burden for all licensees should be no more than about 4,300 staff hours for the preparation of the manifest instead of just preparation of DOT shipping papers and 1,000 hours for investigating and reporting on late or missing shipments. Reactor licensees, who are not small entities, ship at least half the waste now shipped to disposal sites. The remainder is shipped by hospitals, universities, industrial firms, etc., who may or may not be small entities. Thus, less than half this burden should fall on small entities based on relative volumes of wastes shipped. The waste classification and characteristics portion of the rule does provide relief for most wastes produced by the small entities, i.e., Class A wastes. Where radiological hazard permits, segregated disposal has been provided as an option to complying with more restrictive waste acceptance requirements for Class B and C wastes.

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

#### List of Subjects in 10 CFR Part 61

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

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

of the Code of Federal Regulations are published as a document subject to codification.

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

## PART 61—LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

### Subpart A—General Provisions

- Sec.
- 61.1 Purpose and scope.
  - 61.2 Definitions.
  - 61.3 License required.
  - 61.4 Communications.
  - 61.5 Interpretations.
  - 61.6 Exemptions.
  - 61.7 Concepts.
  - 61.8 Reporting, recordkeeping, and application requirements: OMB approval not required.
  - 61.9 Employee protection.

### Subpart B—Licenses

- 61.10 Content of application.
- 61.11 General information.
- 61.12 Specific technical information.
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The Standard Review Plan (SRP) provides guidance to staff reviewers acting on rulemaking petitions in an expeditious manner to exempt from regulation radioactive waste determined to be Below Regulatory Concern (BRC), as called for in the Low-Level Radioactive Waste Policy Amendments Act of 1985. The review plan is designed to ensure the quality and uniformity of staff reviews and to present a well-defined basis for the staff's evaluation of BRC petitions. The plan serves to improve the understanding of the staff's review by interested members of the public and the industry. It also provides information about the BRC rulemaking process to a wider audience.

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