

0063314

HNF-20862
Revision 0

232-Z Contaminated Waste Recovery Process Facility Waste Management Plan

RECEIVED
JAN 04 2005
EDMC

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford
P.O. Box 1000
Richland, Washington

DOES NOT CONTAIN CLASSIFIED OR
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

Reviewing
Official / ADC: *James B. Helms*
Date: 11/16/04

Approved for Public Release;
Further Dissemination Unlimited

232-Z Contaminated Waste Recovery Process Facility Waste Management Plan

Document Type: WP

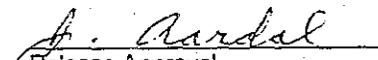
Program/Project: PFP CLOSURE PROJECT

Date Published
November 2004

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford
P.O. Box 1000
Richland, Washington


Release Approval

11-29-2004
Date

Approved for Public Release;
Further Dissemination Unlimited

TRADEMARK DISCLAIMER

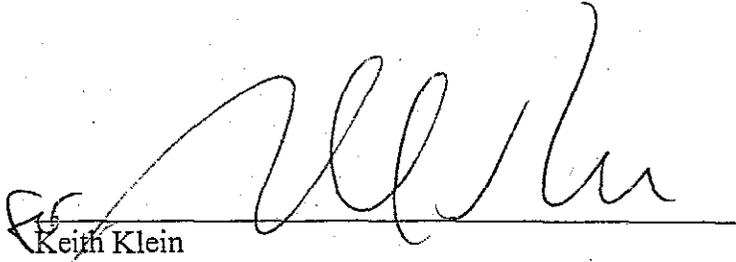
Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.
Available in paper copy.

Printed in the United States of America

Approvals

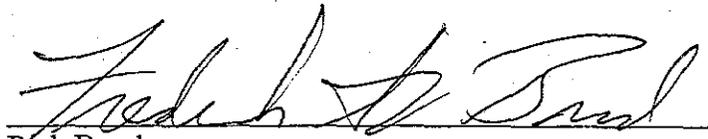
HNF-20862, 232-Z Contaminated Waste Recovery Process Facility Waste Management Plan, Revision 0.



Keith Klein
Manager, Richland Operations Office
United States Department of Energy

12/14/04

Date



Rick Bond
Facilities Transition Project Manager
Washington State Department of Ecology

12/14/04

Date

Date Received for Clearance Process (MM/YY/DD) **11-29-04**

INFORMATION CLEARANCE FORM

- A. Information Category**
- Abstract
 - Summary
 - Visual Aid
 - Full Paper
 - Other _____
 - Journal Article
 - Internet
 - Software
 - Report

B. Document Number HNF-20862, Revision 0

C. Title
232-Z Contaminated Waste Recovery Process Facility Waste Management Plan

D. Internet Address

- E. Required Information**
1. Is document potentially Classified? No Yes (MANDATORY)
[Signature]
 Manager's Signature Required
- If Yes *[Signature]* No Yes Classified
 ADC Signature Required
2. References in the Information are Applied Technology No Yes
 Export Controlled Information No Yes

3. Does Information Contain the Following: (MANDATORY)
- a. New or Novel (Patentable) Subject Matter? No Yes
 If "Yes", Disclosure No.: _____
- b. Information Received in Confidence, Such as Proprietary and/or Inventions?
 No Yes If "Yes", Affix Appropriate Legends/Notices.
- c. Copyrights? No Yes If "Yes", Attach Permission.
- d. Trademarks? No Yes If "Yes", Identify in Document.
4. Is Information requiring submission to OSTI? No Yes
5. Release Level? Public Limited

F. Complete for a Journal Article

1. Title of Journal _____

G. Complete for a Presentation

1. Title for Conference or Meeting _____

2. Group Sponsoring _____

3. Date of Conference _____ 4. City/State _____

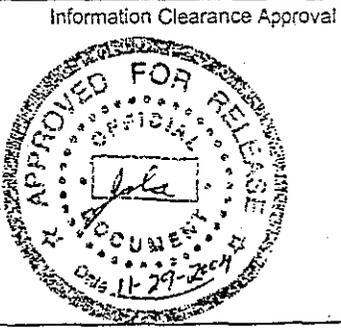
5. Will Information be Published in Proceedings? No Yes 6. Will Material be Handed Out? No Yes

H. Author/Requestor **Responsible Manager**

D. S. Takasumi *[Signature]* **J. R. Hilliard** *[Signature]*
 (Print and Sign) (Print and Sign)

Reviewers	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	<input checked="" type="checkbox"/>	<i>Jennifer T. Curtis for</i> S. B. Cherry	<i>Jennifer T. Curtis</i>	<input checked="" type="radio"/> Y / N
Office of External Affairs	<input type="checkbox"/>			Y / N
DOE-RL	<input checked="" type="checkbox"/>	G. I. Goldberg	<i>[Signature]</i>	<input checked="" type="radio"/> Y / N
Other	<input checked="" type="checkbox"/>	M. L. Spracklen	<i>[Signature]</i>	<input checked="" type="radio"/> Y / N
Other	<input type="checkbox"/>			Y / N

- J. If Information Includes Sensitive Information and is not to be released to the Public indicate category below.**
- Applied Technology
 - Personal/Private
 - Proprietary
 - Business-Sensitive
 - Predecisional
 - UCNI
 - Protected CRADA
 - Export Controlled
 - Procurement-Sensitive
 - Patentable
 - Other (Specify) _____



K. If Additional Comments, Please Attach Separate Sheet

ADMINISTRATIVE DOCUMENT PROCESSING AND APPROVAL

DOCUMENT TITLE: 232-Z Contaminated Waste Recovery Process Facility Waste Management Plan	OWNING ORGANIZATION/FACILITY: Fluor Hanford
---	---

Document Number: HNF-20862	Revision/Change Number: 0
----------------------------	---------------------------

DOCUMENT TYPE (Check Applicable)
 Plan Report Study Description Document Other

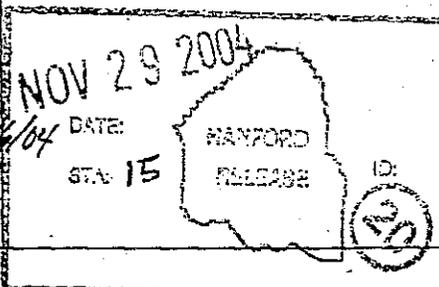
DOCUMENT ACTION New Revision Cancellation

RESPONSIBLE CONTACTS	
Name	Phone Number
Author: D. S. Takasumi	372-0249
Manager: J. R. Hilliard	372-0093

DOCUMENT CONTROL
 Does document contain scientific or technical information intended for public use? Yes No
 Does document contain controlled-use information? Yes No
 ("Yes" requires information clearance review in accordance with HNF-PRO-184)

DOCUMENT REVISION SUMMARY
 NOTE: Provide a brief description or summary of the changes for the document listed.

REVIEWERS	
Name (print)	Organization
Others	

APPROVAL SIGNATURES		RELEASE / ISSUE
Author:	11/16/04	
Name: (Print) D. S. Takasumi <i>D S Takasumi</i>	Date	
Responsible Manager:		
Name: (Print) J. R. Hilliard <i>JRH</i>	Date 11/16/04	
Other: Interpretive Authority	11/16/04	
Name: (Print) F. A. Ruck III <i>F A Ruck III</i>	Date	

232-Z Contaminated Waste Recovery Process Facility Waste Management Plan

CONTENTS

1.0	INTRODUCTION	4
2.0	PROJECT WASTE STREAMS	5
2.1	LOW-LEVEL WASTE	6
2.2	DANGEROUS AND MIXED WASTE	9
2.3	TRANSURANIC WASTE	9
2.4	TRANSURANIC-MIXED WASTE	9
2.5	PCB WASTE	9
3.0	WASTE CHARACTERIZATION	10
4.0	WASTE DESIGNATION	10
5.0	WASTE MINIMIZATION	10
6.0	WASTE HANDLING AND STORAGE	10
7.0	WASTE PACKAGING AND TRANSPORTATION	11
7.1	PACKAGING	11
7.2	SHIPPING PAPERWORK	12
7.3	MARKINGS AND LABELING	12
8.0	WASTE TREATMENT	12
8.1	SOLIDIFICATION	12
8.2	ENCAPSULATION	13
8.3	SEPARATION	13
8.4	ELEMENTARY NEUTRALIZATION	14
8.5	FILTRATION	14
8.6	MERCURY AMALGAMATION	15
8.7	SIZE REDUCTION	15
8.8	REPACKAGING	15
9.0	WASTE DISPOSAL	15
10.0	REFERENCES	16

ATTACHMENTS

- 1. WASTE CONTAINER STORAGE INSPECTION CHECKLIST ATT 1-1
- 2. ON SITE SHIPPING CHECKLIST ATT 2-1
- 3. DRIVER'S INSTRUCTIONS FOR EXCLUSIVE USE OF VEHICLES AND
EMERGENCY NOTIFICATION ATT 3-1

FIGURES

- Figure 1. Environmental Restoration Disposal Facility Location on the Hanford Site. 7
- Figure 2. 232-Z Contaminated Waste Recovery Process Facility On-site Waste Storage and
Staging Areas..... 8

ACRONYMS

ACM	asbestos-containing material
ARARs	applicable or relevant and appropriate requirements
CDL	commercial driver's license
CFR	Code of Federal Regulations
CWC	Central Waste Complex
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
DOT	U.S. Department of Transportation
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
LLW	low-level waste
PCB	polychlorinated biphenyl
PSN	proper shipping name
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RQ	reportable quantity
SARP	safety analysis report for packaging
TC	toxicity characteristic
TI	transport index
TRU	transuranic
TSCA	<i>Toxic Substances Control Act of 1976</i>
UN/NA	United Nations/North American Hazardous Materials Code
WAC	Washington Administrative Code
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

1.0 INTRODUCTION

Management and disposal of wastes resulting from facility preparations, sampling and analysis, decontamination, waste packaging and storage, and demolition activities (i.e., decommissioning activities) for the 232-Z Contaminated Waste Recovery Process Facility (232-Z Building) will be performed in accordance with the applicable or relevant and appropriate requirements (ARARs) specified in the Action Memorandum for *Non-Time Critical Removal Action at the 232-Z Contaminated Waste Recovery Process Facility* (Letter 04-AMCP-0486) in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA). Waste will be packaged to meet the applicable waste acceptance criteria [e.g., Environmental Restoration Disposal Facility (ERDF) or Central Waste Complex (CWC) Waste Acceptance Criteria (WAC)].

A variety of waste streams will be generated under the selected removal action alternative. It is anticipated that most of the waste will be designated as low-level waste (LLW). However, quantities of transuranic (TRU) waste, dangerous or mixed waste, polychlorinated biphenyl (PCB) - contaminated waste, and asbestos and asbestos-containing material (ACM) also may be generated. The great majority of the waste will be in a solid form; however, some limited volumes of aqueous solutions might be generated.

Radioactive wastes are governed under the authority of the *Atomic Energy Act of 1954*. TRU wastes will be managed at the CWC.

The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste are governed by the *Resource Conservation and Recovery Act of 1976* (RCRA). Authority to implement most of the RCRA was delegated to the State of Washington, which implements RCRA requirements under WAC 173-303. The substantive provisions of the dangerous waste standards for generation and storage will apply to the management of any dangerous or mixed waste generated at the 232-Z Building. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference.

Regulations implementing the *Toxic Substances Control Act of 1976* (TSCA) contain specific provisions for PCB waste, including PCB waste that contains a radioactive component. PCB wastes will be managed based solely on the radioactive components of the waste, without regard to the PCB constituents, as authorized through 40 CFR 761.

Waste that is designated as LLW and meets the ERDF waste acceptance criteria will be disposed at the ERDF, which is engineered to meet the performance standards contained in 10 CFR 61.

Waste designated as dangerous or mixed waste will be treated, to the extent practical, as appropriate to meet land disposal restrictions and the ERDF acceptance criteria, and then disposed at the ERDF. The ERDF is also engineered to meet landfill design standards under WAC 173-303-665. All applicable packaging and pre-transportation requirements for dangerous or mixed waste generated at the 232-Z Building will be identified and implemented prior to movement of any wastes.

CERCLA Section 104(d)(4) states that where two or more noncontiguous facilities are reasonably related on the basis of geography, or threat or potential threat, the facilities may be treated as one for purposes of CERCLA response actions. Consistent with this policy and language contained in the ERDF Record of Decision, the ERDF will be considered to be on-site for purposes of this removal action, and waste will be transferred between the 232-Z Facility and the ERDF without requiring a permit, or an off-site determination by the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA). If the project requires the use of other waste management facilities on the Hanford Site, their status must be evaluated for accepting CERCLA wastes, pursuant to the off-site rule. Management at such facilities must meet all substantive and administrative aspects of regulations instead of ARARs.

Waste designated as PCB waste will likely be disposed at the ERDF or sent to the CWC, depending on whether it is a LLW or a TRU waste, respectively. The ERDF is authorized to accept solid PCB waste containing PCB for disposal. Liquid wastes are not allowed for disposal at the ERDF if they contain ≥ 50 ppm PCB. Any PCB waste that does not meet the ERDF or CWC Waste Acceptance Criteria will be retained at a Hanford Site PCB storage area meeting the requirements for TSCA storage. The waste will be transported for future disposal at an appropriate disposal facility.

Asbestos and ACM will be removed, packaged as appropriate, and disposed of at the ERDF or sent to the CWC.

It is anticipated that all alternatives will be performed in compliance with all waste management ARARs. All waste streams will be evaluated, designated, and managed in compliance with the appropriate requirements. Prior to disposal, waste will be managed in a protective manner to prevent releases to the environment or unnecessary exposure to workers.

This plan outlines the waste management practices that will be performed during project activities to implement federal and state requirements. Although not an ARAR, the plan also provides guidance for waste packaging, marking, and labeling to ensure compliance with U.S. Department of Transportation (DOT) requirements specified in 49 CFR 171-178, or an equivalent level of safety for shipments occurring on the Hanford Site, once the waste leaves the 232-Z Building on-site area.

2.0 PROJECT WASTE STREAMS

The 232-Z Building removal action may generate solid, dangerous, LLW, PCB, and/or mixed wastes, as well as TRU wastes, during decommissioning activities. All wastes will be evaluated and managed to comply with the appropriate waste management ARARs.

The majority of the LLW will be disposed of at the ERDF and will follow the waste acceptance criteria for the ERDF. Wastes will be shipped either in containers or in plastic-wrapped bulk shipments, depending on the characteristics of the waste matrix. Waste shipped off-site shall have prior Ecology and EPA approval.

2.1 LOW-LEVEL WASTE

Any regulated waste not designated as mixed waste, TRU, greater-than- Class-C, or TRU-mixed wastes will be managed as LLW.

The LLW will include step-off pad wastes, soft waste, material used in decontamination activities, process items that have been decontaminated below TRU levels, most building rubble, and waste packages designated as LLW. This LLW will be mainly solid in form, although some liquid and sludge waste may be generated during the decommissioning activities. LLW will be shipped to the ERDF (Figure 1), and will be packaged and stored in temporary staging areas both within and immediately outside the PFP fenced area prior to shipment. Figure 2 shows the onsite area planned for waste storage and staging during the removal action. Waste containers may be staged within or adjacent to the 232-Z Facility and in other areas within the PFP fence. A staging area created outside of the PFP fenced area will be used to temporarily store waste destined for the ERDF in both roll-off boxes and smaller containers to limit the impact from logistics associated with driver access to the PFP.

Figure 1. Environmental Restoration Disposal Facility Location on the Hanford Site.

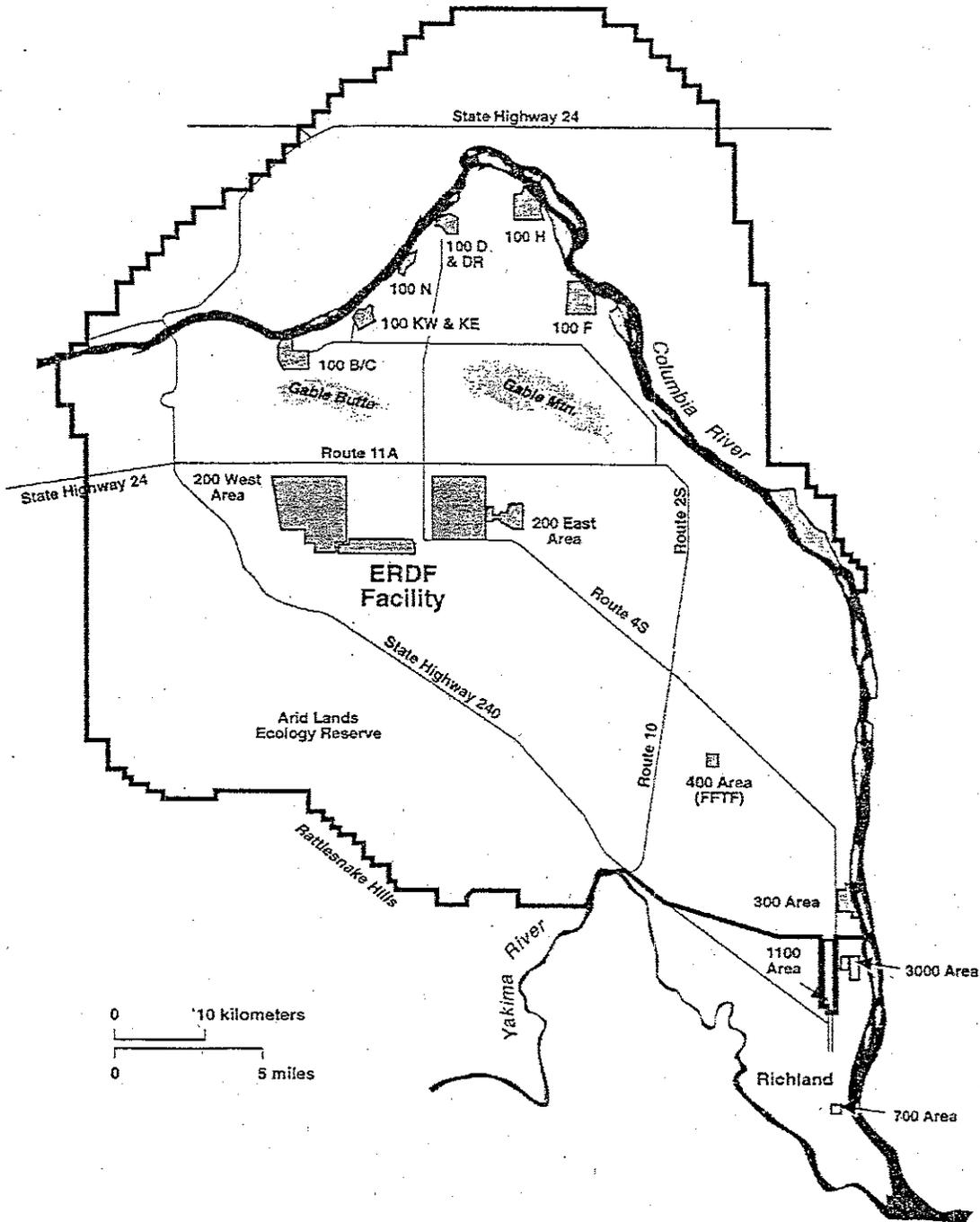
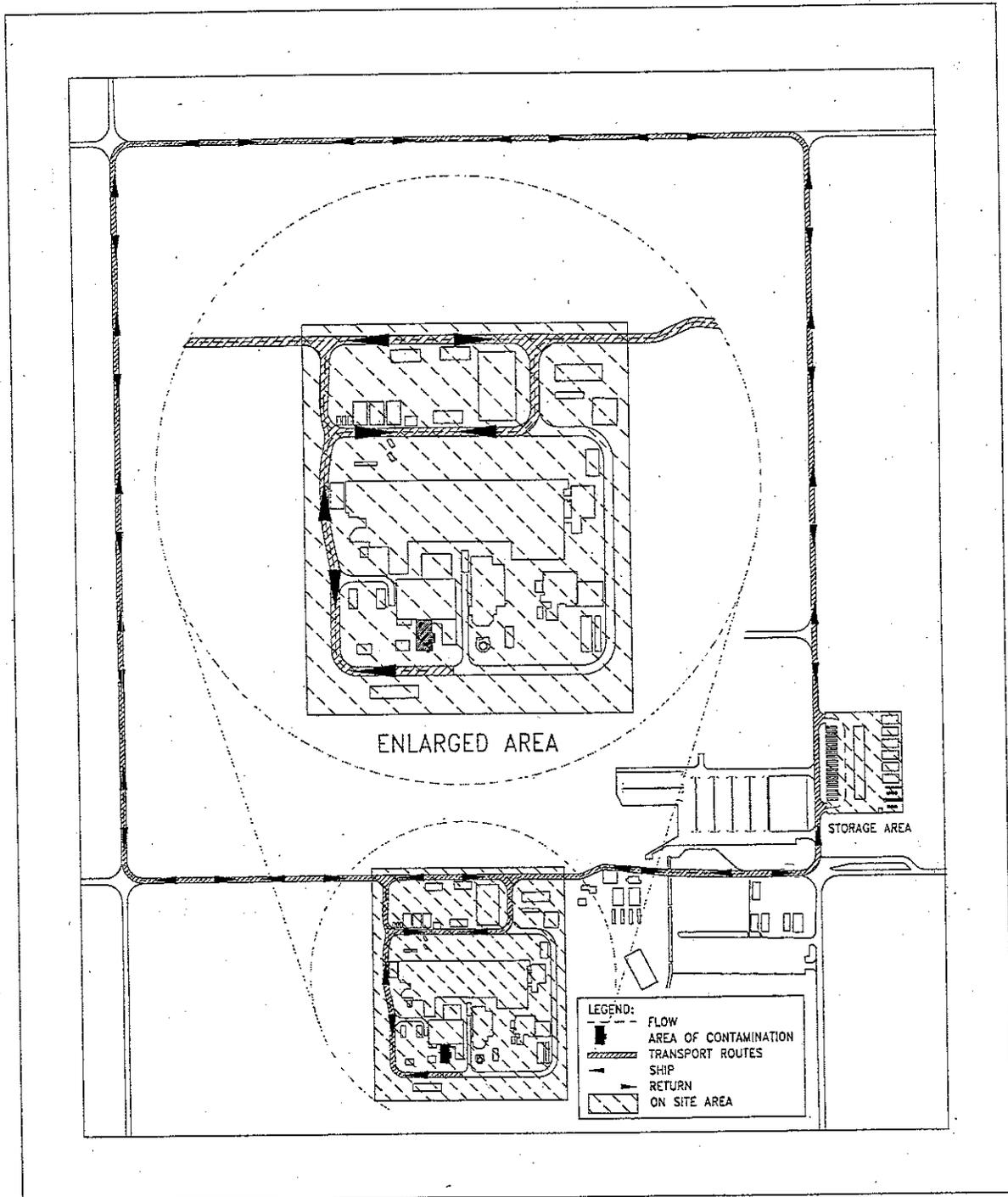


Figure 2. 232-Z Contaminated Waste Recovery Process Facility Onsite Waste Storage and Staging Areas



2.2 DANGEROUS AND MIXED WASTE

Dangerous waste constituents in these wastes are primarily toxicity characteristic (TC) metals in paints or from residual process materials. Potential dangerous waste sources also include mercury switches, light ballasts and bulbs, and exit signs, as well as limited amounts of paints scraped from specific areas (e.g., scrubber cell wall). Most of the removable items (e.g., switches, ballasts, and bulbs) will be disposed of prior to commencing the demolition activities. Paint samples will be collected from throughout the facility to establish a basis for designating building debris and establishing inventory for disposal at the ERDF, based on the concentration of TC metals in the paint and other sampled materials.

The source of the mixed waste stream will likely be remaining contaminant residues (e.g., lead, PCBs) on radioactively contaminated facility equipment and surfaces and the chemicals/materials used for decontamination.

The only potential significant source of liquid, radioactive dangerous waste is expected to be from the use of acids and cleaning solutions in specific radiological, surface decontamination efforts. These solutions will be absorbed onto rags, characterized, and packaged with an approved absorbent for disposition.

2.3 TRANSURANIC WASTE

Some wastes may designate as TRU (nuclides with a half-life greater than 20 years that exist in a concentration greater than 3.7 KBq/g (100 nCi/g)). The process system equipment, glovebox, scrubber cell, exhaust duct and filters, and facility drains are all potential sources of TRU waste. Some of the facility surface materials removed during decontamination may also be TRU waste, most likely in solid form. Liquids and sludges in the process system and drains may also be encountered.

2.4 TRANSURANIC-MIXED WASTE

TRU-mixed wastes may exist in the form of lead shielding and equipment. These wastes, in all probability, will be solids; however, residual liquid could be generated from decontamination activities, or process-related systems.

2.5 PCB WASTE

The paint used to coat many of the facility's interior surfaces (e.g., walls, ceilings, etc.) may contain elevated levels of PCBs and could result in a TSCA designation for the underlying matrix. Although the paint in most of the facility will not be removed from the underlying substrate, for purposes of waste designation the concentration in the paint is applied to the entire matrix. In addition, light ballasts and other equipment may contain some level of PCBs. Consequently, some of the waste streams discussed above may also be contaminated with PCBs.

3.0 WASTE CHARACTERIZATION

All waste generated as a result of project activities will be characterized in accordance with the approved sampling and analysis plan (DOE/RL-2004-22), data quality objectives (HNF-19599), and waste acceptance criteria.

4.0 WASTE DESIGNATION

Waste profiles and designations will be developed on an as-needed basis throughout the project. The characterization criteria referenced in Section 3.0 provide the rationale and strategy for conducting sampling and analysis activities in support of waste designation. They contain sampling, analytical, and radiological survey requirements to support waste designation and disposal decisions during all phases of the removal action project. The characterization data will be used to prepare waste profile summaries for evaluations against waste acceptance criteria to determine appropriate disposal options.

5.0 WASTE MINIMIZATION

By using waste separation and segregation, waste generation can be kept to a minimum. It should be noted that waste minimization includes not only minimizing volume of waste, but also can be applied to minimizing the volume of waste in a given waste category, e.g., TRU-mixed decontaminated to TRU waste or TRU waste decontaminated to LLW, etc. Waste will be segregated at the 232-Z Building as it is generated. Wastes will be separated into the following categories: LLW, LLMW, dangerous, TRU, and TRU-mixed.

When performing decontamination within the 232-Z Building, decontaminating agents and solutions will be selected to minimize quantities of TRU substances. The process will include steps to minimize the volume of waste generated when decontamination agents are used.

6.0 WASTE HANDLING AND STORAGE

All wastes generated from the 232-Z Building activities will be stored in designated waste storage areas and identified by signs reading "CERCLA WASTE MANAGEMENT AREA." Incompatible wastes will be separated within the designated waste storage areas to prevent commingling of the wastes.

Packages containing radioactive waste will be staged for shipment to the ERDF or the CWC in a radiological materials area.

All waste storage resulting from this removal action shall meet the ARARs identified in the Action Memorandum. Appropriate areas will be established in which waste is staged prior to

shipment. These waste staging areas will be designated within the on-site area and typically will be within or in close proximity to the 232-Z Building. However, because of other ongoing activities adjacent to 232-Z within the PFP area, waste staging areas may be relocated as needed within the on-site area to facilitate 232-Z demolition project and other PFP project activity logistics. Waste staging areas are necessary for implementation of the 232-Z removal action.

Stored wastes shall be inspected weekly to verify container integrity, legibility of markings and labels, and proper placement of signs. Container inspections will be documented on an inspection checklist such as that provided as an example in Attachment 1 or other similar checklist. An inventory of the waste generated will be maintained. A Waste Specialist or trained Solid Waste Operator will inspect all waste containers as they are filled.

Before shipment to the ERDF, the CWC, or another off-site location, the containers must be properly sealed and checked for leaks or other damage. At that time, a final inspection will be performed.

7.0 WASTE PACKAGING AND TRANSPORTATION

Although not an ARAR, guidance for waste packaging, marking, and labeling is described to ensure consistency with the DOT requirements specified in 49 CFR 171-178, or an equivalent level of safety for shipments occurring on the Hanford Site, once the waste leaves the 232-Z Building on-site area.

Before transport to the ERDF or another disposal site, all waste containers must be properly packaged, marked, labeled, and in proper condition for disposal. The LLW may be shipped in either non-bulk or bulk mode. Dangerous and mixed waste must be shipped in specific containers for either storage or disposal, and TRU and TRU-mixed waste must be shipped in specific containers for storage at the CWC. This section explains how to package, mark, and label LLW, dangerous, PCB, mixed, TRU, and TRU-mixed waste. It is anticipated that very little non-regulated waste will be generated.

7.1 PACKAGING

Regulated waste from the 232-Z Building activities will be packaged in the following types of packages or equivalent approved packaging guidelines for on-site shipments:

- a) Strong, tight packaging
- b) Industrial packaging
- c) Type A packaging
- d) Type B packaging.

Any contaminated soil and other remediation waste (e.g., building rubble) that can be characterized as LLW ($<3.7 \text{ KBq/g}$ [100 nCi/g] TRU) will be shipped in bulk to the ERDF using a subcontractor transport conveyance. This conveyance uses roll-off/roll-on containers that will have liners, which will be specified in the waste profile or Waste Shipping and Receiving Plan

for the waste. Additionally, the trailer units will be equipped with tarping. If needed, other approved packages (e.g., burial boxes and/or sea-land containers) may be used for bulk, radioactive shipments.

Waste not appropriate for bulk shipment (e.g., piping, processing equipment) will be physically cut to size, packaged, and shipped in non-bulk containers to meet the appropriate facility's waste acceptance criteria.

All containers will be properly closed, and in the event that Type A packaging is used, a seal shall be affixed (49 CFR 173.412[a]). The containers must also be weighed and visually inspected for leaks or other damage before the waste is transported. The Waste Specialist will use a Shipping Checklist such as that provided as an example in Attachment 2 or other similar checklist.

7.2 SHIPPING PAPERWORK

The applicable shipping paperwork will be prepared for each waste shipment. A tracking form will be completed for each waste shipment destined for the ERDF. The completed tracking form is used as the basic shipping document and must accompany the shipment when the waste is sent to the ERDF. Emergency response information (Attachment 3) must be attached to the tracking form.

7.3 MARKINGS AND LABELING

All markings and labeling will be completed under the direction of the Waste Specialist.

8.0 WASTE TREATMENT

Treatment of waste streams may be necessary to provide for safe transport and effective disposal. The waste treatment may be performed on-site either at the 232-Z Building or the ERDF, as practical, in accordance with the substantive requirements of WAC 173-303. It is anticipated that the majority of waste treatment for this project will take place at the ERDF. Waste treatment options may include solidification, separation, elementary neutralization, filtration, encapsulation, amalgamation, size reduction, or repackaging, and will be implemented using the criteria identified or the description of the process, provided below. Few of these treatment alternatives are anticipated for this project, but are included below to illustrate potential approaches for managing different waste forms.

8.1 SOLIDIFICATION

Solidification is a technique that physically limits the mobility of dangerous waste by reducing or eliminating free liquids in the waste.

The following criteria apply to meet treatment by solidification:

- The solidified waste must meet the Paint Filter Liquids Test, specified as Method 9095 of the EPA document, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, document number SW-846 (SW-846), for assessing the amount of free liquid in the waste. The Waste Specialist or designee must ensure that the solidification technique used can solidify all waste in the container or tank to this standard. In most cases, this will mean ensuring adequate mixing of the waste with the solidification material.
- The waste must be solidified using a non-biodegradable solidification material approved by the receiving facility (ERDF, CWC).

8.2 ENCAPSULATION

Encapsulation involves encasing the waste in a substance to preclude its future release to the environment. The land disposal regulations describe two forms of encapsulation:

- Macroencapsulation, which involves the application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert organic materials to substantially reduce surface exposure to potential leaching media. The encapsulating material must completely encapsulate the debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (e.g., leachate, other water, microbes).
- Microencapsulation involves stabilization of the debris with the following reagents (or waste reagents) such that the leachability of the hazardous contaminant is reduced, using (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust). Reagents (e.g., iron salts, silicates, and clays) may be added to enhance the set/cure time and/or compressive strength, or to reduce the leachability of the hazardous constituents.

8.3 SEPARATION

Separation of liquids and solids through decanting is the process of actively separating materials by utilizing differing specific gravities. The clarified supernatant is removed and the solids are preferentially concentrated in a smaller fraction of the liquid.

Separation through sedimentation or clarification is the settling out by gravity of solid particles suspended in a liquid.

Separation through oil skimming or phase separation is the equivalent of decanting, but for liquid-liquid systems where the liquid phases are immiscible and/or have differing specific gravities.

The following criteria apply to meet treatment by separation:

- a) Assure that ignitable or reactive waste treatment in tanks complies with WAC 173-303-640(9)(a).

- b) No processes, which generate toxic or flammable gasses or volatilize dangerous waste materials directly to the air, may be used.

8.4 ELEMENTARY NEUTRALIZATION

Elementary neutralization means the process of neutralizing wastes that are dangerous wastes only because they exhibit the characteristic of corrosivity as defined by one or more of the following properties:

- An aqueous waste with a pH less than or equal to 2, or greater than or equal to 12.5.
- A liquid that corrodes steel at rates and under conditions specified in WAC 173-303-090(6)(ii).
- A solid waste that when mixed with an equal weight of water results in a solution, the liquid portion of which has either a pH less than or equal to 2, or greater than or equal to 12.5.

The following criteria apply to meet treatment by elementary neutralization:

- Elementary neutralization must be conducted in accumulation tanks or containers.
- The treatment residuals must exhibit: a) a pH of greater than 2 and less than 12.5 prior to on-site management or disposal, or b) a pH that meets the requirements of a delegated municipality or local solid waste authority.
- Elementary neutralization must not pose a risk to human health and the environment.
- The resulting treatment residuals must be managed and disposed of in accordance with state and local regulations.

8.5 FILTRATION

Filtration is the process used to: a) dewater waste effluents, slurries, and sludges generated from industrial treatment processes, and b) remove undissolved heavy metals present in suspended solids. It does not reduce the toxicity of the waste.

The following criteria apply to meet treatment by filtration:

- The filtration equipment and its connection to the tank/container are totally enclosed.
- The dewatered liquid (filtrate) and washwater stream from the filtration process is designated and handled appropriately.
- The filter cake or filter media is accordingly designated and handled as hazardous or non-hazardous waste.

- There are no regulated spills or releases from the operation to the environment, or if there are, they are cleaned up immediately.
- All equipment is decontaminated and/or disposed, as needed.

8.6 MERCURY AMALGAMATION

Mercury amalgamation is the chemical process used to bind elemental mercury waste with another chemical for stabilization, and must meet the following criteria:

- Elemental mercury waste may be combined with a solid amalgam for waste stabilization prior to disposal. After treatment by mixing the amalgam and the elemental mercury, there can be no freestanding liquids.

8.7 SIZE REDUCTION

Much of the TRU mixed waste must be disassembled or cut into sections for size reduction in order to place the waste in an approved waste container; therefore, this is considered a treatment.

8.8 REPACKAGING

Occasionally, a waste may need to be repackaged, due to void space issues or the need to remove a waste component from the already packaged container.

9.0 WASTE DISPOSAL

As stated previously, it is anticipated that most of the LLW, LLMW, and debris from the removal action will be disposed of at the ERDF, which is designed to meet RCRA minimum technical requirements for land disposal. The ERDF can also accept some asbestos and PCB waste. The criteria for the ERDF's acceptance of waste are presented in the *Environmental Restoration Disposal Facility Waste Acceptance Criteria* (BHI-00139).

Any PCB waste that does not meet the ERDF waste acceptance criteria, and TRU and TRU-mixed waste, will be sent to the CWC for storage awaiting final disposal according to CWC waste acceptance criteria.

Ecology and EPA approval is required prior to sending any waste off-site.

TRU waste will be placed in interim storage at the CWC and will be shipped to the Waste Isolation Pilot Plant in accordance with the schedule established for completing remedial actions at Hanford.

Dangerous waste that does not meet the ERDF waste acceptance criteria will be disposed of at a permitted offsite facility, with an approved offsite determination.

10.0 REFERENCES

- 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," *Code of Federal Regulations*, as amended.
- 40 CFR 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," *Code of Federal Regulations*, as amended.
- 49 CFR 171, "General Information, Regulations, and Definitions," *Code of Federal Regulations*, as amended.
- 49 CFR 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements," *Code of Federal Regulations*, as amended.
- 49 CFR 173, "Shippers – General Requirements for Shipments and Packagings," *Code of Federal Regulations*, as amended.
- 49 CFR 174, "Carriage by Rail," *Code of Federal Regulations*, as amended.
- 49 CFR 175, "Carriage by Aircraft," *Code of Federal Regulations*, as amended.
- 49 CFR 176, "Carriage by Vessel," *Code of Federal Regulations*, as amended.
- 49 CFR 177, "Carriage by Public Highway," *Code of Federal Regulations*, as amended.
- 40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.
- 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, as amended.
- BHI-00139, 2002, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 4, Bechtel Hanford, Inc., Richland, Washington.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 U.S.C. 9601, et seq.
- DOE Order 435.1, *Radioactive Waste Management*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE/RL-2004-22, 2004, *Sampling and Analysis Plan for the Contaminated Waste Recovery Process Facility, Building 232-Z*, Fluor Hanford, Inc., Richland, Washington.

HNF-EP-0063, 2004, *Hanford Site Solid Waste Acceptance Criteria*, Rev. 10, Fluor Hanford, Inc., Richland, Washington.

HNF-19599, 2004, *Data Quality Objectives for the Contaminated Waste Recovery Process Facility, Building 232-Z*, Fluor Hanford, Inc., Richland, Washington.

WAC 173-303, "Dangerous Waste Characteristics," *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

Letter, 04-AMCP-0486, K. A. Klein, DOE-RL to M. A. Wilson, Ecology, *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Non-Time Critical Removal Action Memorandum for Removal of the 232-Z Contaminated Waste Recovery Process Facility at the Plutonium Finishing Plan.*

**ATTACHMENT 1
Sample Waste Container Inspection Checklist**

WASTE CONTAINER STORAGE INSPECTION CHECKLIST			
Facility/Site Location: _____			
Inspector: _____ Printed Name/Signature			
Date/Time of Inspection: _____			
SCOPE OF INSPECTION: (check as applicable)			
<input type="checkbox"/> 90-Day Accumulation <input type="checkbox"/> RCRA not on clock <input type="checkbox"/> IDW <input type="checkbox"/> TSCA <input type="checkbox"/> SAA <input type="checkbox"/> CERCLA Remediation Waste Area			
INSPECTION REQUIREMENTS:			
	No Problems Noted	See Comment	Not Applicable
1. Containers are in good physical condition (i.e., not leaking or severely corroding).	□	□	
2. Containers are adequately identified (i.e., marking, labeling, and major risks).	□	□	
3. Containers are compatible with waste type.	□	□	
4. Containers are closed and/or secured except when adding or removing waste.	□	□	
5. Container placement/storage is compliant with all Federal, state, and local laws and/or requirements (i.e., boundaries, signs/communications, spacing).	□	□	
6. As Applicable to Liquids or Solids: Secondary waste containment system(s) is/are in good condition and capable of holding a greater quantity than the primary container and are stored in a manner applicable to the waste type (i.e., stored on pallets, free from leaks, corrosion, ignitability, reactivity).	□	□	□
7. As Applicable: Safety/Emergency Response Equipment in place (i.e., fire extinguishers, communications equipment, spill response kit/equipment).	□	□	□
COMMENTS: 			
Status of Outstanding Actions Previously Identified: 			

ATTACHMENT 2

PFP Shipping Checklist	Yes	No	N/A
Shipment Number			
Date of Shipment			
Is material subject to Safeguards and Security requirements			
Does the material meet Limited Quantity exceptions			
Is the material Type A			
Is the material Type B			
Does material meet LSA requirements			
Does the material meet SCO requirements			
Is the material a reportable quantity (RQ)			
Does the material meet radiation and contamination levels			
Does the material require the use of a SARP			
Does the material meet the requirements of the SARP			
Is package approved for shipment			
Is the package marked and labeled correctly			
Is material identified on the shipping papers			
Do the shipping papers indicate an RQ			
Is the correct proper shipping name (PSN) identified			
Hazard class(es) and identification number (UN/NA) shown			
Physical and chemical form shown			
Radioactive activity shown in SI units (Terabecquerels)			
Category label and transport index (TI) shown			
Is the material fissile excepted			
Is the material being shipped as exclusive use			
Is the appropriate group notation for LSA or SCO shown			
Quantity of material is shown			
Emergency response phone number shown			
Exclusive use instruction are included as part of shipping papers			
Emergency response guide number(s) shown			
Driver has current CDL with correct endorsements			
Driver has an Emergency Response Guidebook			
Vehicle/Trailer DOT inspection completed within last 12 months			
Vehicle Placarded			
Shipping papers signed and dated			
Receiver is notified of shipment and authorized to receive			
Has safeguards sealed the vehicle			
Has patrol been notified			
Printed Name	Signature	Date	

ATTACHMENT 3

**DRIVER'S INSTRUCTIONS FOR EXCLUSIVE USE OF
VEHICLES AND EMERGENCY NOTIFICATION**

The *Code of Federal Regulations* (49 CFR 173.403 and 10 CFR 71.47[d]) requires that specific instruction for maintenance of sole or exclusive-use shipment controls be provided by the shipper to the carrier. These instructions must be included with the shipping papers accompanying the shipment.

The following instructions must be followed for exclusive use shipments:

1. Do not change fifth-wheel adjustment.
2. Do not move packages within the vehicle.
3. The shipment must be loaded by the shipper and unloaded by the consignee from the transport vehicle in which originally loaded.
4. If the vehicle is initially placarded "RADIOACTIVE" by the shipper, it must remain placarded at all times until unloaded by the consignee.
5. If the vehicle is involved in an accident or is required to make an emergency stop that results in a shift in the load, notify the shipper.
6. Carrier should avoid actions that will unnecessarily delay delivery or unnecessarily expose transport workers or members of the general public to the shipment (10 CFR 71.47[d]).

EMERGENCY CONTACT: (509) 373-3800
