Material-Not-Categorized- As-Waste Survey for 1992

P. H. Jacobsen

Date Published
July 1993

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

**Westinghouse
Hanford Company**

P.O. Box 1970
Richland, Washington 99352

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

MASTER

Approved for Public Release

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Document Title: Material-Not-Categorized-As-Waste Survey for 1992

Prepared by:

P. H. Jacobsen, Plant Engineer
Solid Waste Programs

3/26/93
Date

Approved by:

M. M. McCarthy, Manager
Solid Waste Programs

29 Mar 93
Date

ORIGINAL

Date Received: 6/3/93		INFORMATION RELEASE REQUEST		Reference: WHC-CM-3-4	
Complete for all Types of Release					
Purpose			ID Number (include revision, volume, etc.) WHC-EP-0626		
☐ Speech or Presentation ☐ Full Paper (Check only one suffix) ☐ Summary ☐ Abstract ☐ Visual Aid ☐ Speakers Bureau ☐ Poster Session ☐ Videotape			☐ Reference ☒ Technical Report ☐ Thesis or Dissertation ☐ Manual ☐ Brochure/Flier ☐ Software/Latabase ☐ Controlled Document ☐ Other		
			List attachments.		
			Date Release Required 7/30/93		
Title Material-Not-Categorized-As-Waste Survey for 1992				Unclassified Category UC-721	
				Impact Level 4	
New or novel (patentable) subject matter? ☒ No ☐ Yes If "Yes", has disclosure been submitted by WHC or other company? ☐ No ☐ Yes Disclosure No(s).			Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? ☒ No ☐ Yes (Identify)		
Copyrights? ☒ No ☐ Yes If "Yes", has written permission been granted? ☐ No ☐ Yes (Attach Permission)			Trademarks? ☒ No ☐ Yes (Identify)		
Complete for Speech or Presentation					
Title of Conference or Meeting			Group or Society Sponsoring		
Date(s) of Conference or Meeting		City/State		Will proceedings be published? ☐ Yes ☐ No Will material be handed out? ☐ Yes ☐ No	
Title of Journal					
CHECKLIST FOR SIGNATORIES					
Review Required per WHC-CM-3-4		Yes	No	Reviewer - Signature Indicates Approval	
				Name (printed)	Signature Date
Classification/Unclassified Controlled					
Nuclear Information	☒	☐		S. J. AMIR	<i>S. J. Amir</i> 6-1-93
Patent - General Counsel	☒	☐		S.W. Berglin	<i>S.W. Berglin</i> 6/8/93
Legal - General Counsel	☒	☐			
Applied Technology/Export Controlled Information or International Program	☐	☒			
WHC Program/Project	☒	☐		M.M. MCCARTHY	<i>M.M. McCarthy</i> 6/8/93
Communications	☐	☒			
RL Program/Project	☒	☐		R.F. Guercia	<i>R.F. Guercia</i> 6/22/93
Publication Services	☒	☐		M.J. Van Vleet	<i>M.J. Van Vleet</i> 7/20/93
Other Program/Project	☐	☒			
Information conforms to all applicable requirements. The above information is certified to be correct.					
References Available to Intended Audience		Yes	No	INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP	
		☒	☐	Stamp is required before release. Release is contingent upon resolution of mandatory comments.	
Transmit to DOE-HQ/Office of Scientific and Technical Information
Author/Requestor (Printed/Signature)		☒	☐		
Date					
P. H. Jacobsen <i>P. H. Jacobsen</i> 4/6/93					
Intended Audience					
☐ Internal ☐ Sponsor ☒ External					
Responsible Manager (Printed/Signature)					
Date					
M. M. McCarthy <i>M.M. McCarthy</i> 6/8/93					
		Date Cancelled		Date Disapproved	

This page intentionally left blank.

MATERIAL-NOT-CATEGORIZED-AS-WASTE SURVEY FOR 1992

ABSTRACT

In October 1992, the U.S. Department of Energy, Richland Field Office requested that Westinghouse Hanford Company respond to a letter from EN-331 asking for completion of a survey of items in storage but not categorized as waste.

This report is a summary of the information from the response issued to the U.S. Department of Energy, Richland Field Office. This report primarily is an aid for estimating future waste volumes that may have been overlooked because of the nature of their classification as material not categorized as waste (i.e., not yet declared waste).

This report is based on the information gathered through an informal survey and should not be used for anything other than an indication of the types of materials yet to be declared waste. Solid Waste Management's intent is that this information be used to identify methods that could be used to treat and/or dispose of these diverse waste streams if decisions are made to declare them as waste.

If an update to the survey is requested in the future, plans are to issue another summary to update the information contained in this document.

This page intentionally left blank.

CONTENTS

1.0 BACKGROUND	1
2.0 INTRODUCTION	1
3.0 REFERENCES	8
APPENDIX A	A-i
APPENDIX B	B-i

LIST OF TABLES

1 Facilities and Contributors.	2
2 Summary of Materials Not Categorized As Waste	4

This page intentionally left blank.

MATERIAL-NOT-CATEGORIZED-AS-WASTE SURVEY FOR 1992

1.0 BACKGROUND

In October 1992, the U.S. Department of Energy, Richland Field Office (RL) requested that Westinghouse Hanford Company (WHC) respond to a letter from EM-331 asking for completion of a survey of items in storage but not categorized as waste (Roberts 1992). The letter contained an attachment with instructions on how to fill out the attached form and what to exclude from the survey (Appendix A).

A similar task was completed by Karl A. Hadley (1990) 2 years earlier. The forms were similar as were the exclusions. Mr. Hadley knew of the request for the 1992 survey and had initiated the work. He also completed most of the notifications and research into who to contact within WHC and the Pacific Northwest Laboratory. Then Solid Waste Programs, WHC, was tasked by Solid Waste Programs, RL, to complete the submittal.

2.0 INTRODUCTION

This report is a summary of the information from the response issued to RL. This report primarily is for use in estimating future waste volumes that may have been overlooked because of the nature of their classification as material not categorized as waste (MNCAW) (i.e., not yet declared waste).

Table 1 is a summary of the facilities and areas and lists the individuals who provided the data.

Table 2 is the actual type of waste and volumes as contained in the survey forms.

Appendix A contains a copy of the letter from RL requesting the survey.

Appendix B contains the Plutonium Finishing Plant (PFP) materials table. The PFP materials were varied and, because of the workload of PFP personnel and classification concerns, the forms were not filled out. Instead, this table, which was used for an earlier material inventory, was submitted in place of the forms.

This report is based on the information gathered through an informal survey and should not be used for anything other than an indication of the types of materials yet to be declared waste. Solid Waste Management's intent is that this information be used to identify methods that could be used to treat and/or dispose of these diverse waste streams if decisions are made to declare them as waste.

Plans are to issue another summary to update the information contained in this document if an update to the survey is requested in the future.

Table 1. Facilities and Contributors.

Facility/Area	Contributor
PUREX/200 East	C. J. Garza
UO ₃ /200 West	C. J. Garza
222-S Labs/200 West	G. J. Warwick
PNL/Various	J. P. Andre
Solid Waste/200 West	P. H. Jacobsen
FFTF/400	J. A. Seamans
PFP/200 West	L. A. Garner
N Reactor/100-N	D. J. Watson
Tank Farms/200 Areas	R. B. Dunn
Miscellaneous	R. L. Salley

FFTF = Fast Flux Test Facility
UO₃ = Uranium Trioxide (Plant)
PFP = Plutonium Finishing Plant
PNL = Pacific Northwest Laboratory
PUREX = Plutonium-Uranium Extraction
(Facility).

Table 2. Summary of Materials Not Categorized
As Waste. (3 sheets)

Description	Volume	
	m ³	MTU
PUREX/UO ₃		
Deactivated equipment and building components	Unknown	--
Essential material tank heels	5.67	--
Canyon acidic water heels	194.04	--
Uranyl nitrate hexahydrate solution	--	202.6
Recovered HNO ₃	486.2	--
Uranium trioxide-depleted uranium	--	105.98
Dissolver heels	19.7	--
Mercury	0.001	--
Neptunium-237 nitrate solution	--	Classified
Zirconium-clad spent fuel	--	0.26
Aluminum-clad spent fuel	--	2.88
Bulk chemicals	100.09	--
Process solutions (uranium/plutonium)	24.05	--
Tributylphosphate/normal paraffin hydrocarbon-contaminated solvent	76	--
Uranium trioxide/low-enriched uranium	--	456.04
E-Cell floor debris (contaminated sludge)	0.96	--
234-5Z Plutonium Finishing Plant		
Low irradiated fuel plates	0.084 E-3	--
222-S Laboratory		
Lead	5.43	--

Table 2. Summary of Materials Not Categorized
As Waste. (3 sheets)

Description	Volume	
	m ³	MTU
Pacific Northwest Laboratory		
Uranium oxide fuel-unirradiated CML	--	2.653
Spent fuel - PITL rods and sections	--	0.7
Spent fuel - PITL fuel	--	1.2
Spent fuel - radiochemistry	--	<0.1
Depleted uranium metal - CML	--	5.3
Spent fuel - 327 Building	--	<0.01
Depleted uranium dioxide - CML	--	0.1
Depleted uranium alloy	--	3.0
Mixed oxide fuel - CML	--	1.1
Spent fuel - PITL assemblies	--	1.2
Solid Waste Programs/222-T		
Shippingport pressurized water reactor core 2 blanket assemblies	--	15.2
Metallic sodium	177	--
Fast Flux Test Facility Operations/400 Area		
Nonradioactive alkali metal	223	--
Lead bricks	-320	--
Test Reactor and Isotope Production (General Atomics) reactor fuel	--	0.015
Unirradiated fuel materials	5	--
Irradiated nonfuel components	4.4	--
Irradiated fuel	--	6.157

Table 2. Summary of Materials Not Categorized
As Waste. (3 sheets)

Description	Volume	
	m ³	MTU
Plutonium Finishing Plant		
See table in Appendix B	--	--
N Reactor/100 Areas		
Residual and fuel basin sludge - 100 N	55.9	--
Residual and fuel basin sludge - 100 K	81.9	--
Borated carbon balls, some contaminated	17	--
Aluminum-clad uranium metal	--	0.16
Irradiated N Reactor weapons-grade fuel	--	330
Irradiated N Reactor fuel-grade fuel	--	1,764
Zircalloy-2 alloy	219	--
Tank Farms		
Lead	1	--

CML = Critical Mass Laboratory
 MTU = metric tons uranium
 PITL = Postirradiation Testing Laboratory
 PUREX = Plutonium-Uranium Extraction (Facility)
 UO₃ = Uranium Trioxide (Plant).

3.0 REFERENCES

- Roberts, R. J., 1992, "Material-Not-Categorized-As-Waste (MNC AW) Survey," Letter No. 9206157B R1, Westinghouse Hanford Company, Richland, Washington, to J. M. Hennig, U.S. Department of Energy, Richland Field Office, Richland, Washington.
- Hadley, K. A., 1990, "Data Input Forms for Material Not Categorized As Waste," DSI, Westinghouse Hanford Company, Richland, Washington, to R. G. Holt, U.S. Department of Energy, Richland Field Office, Richland, Washington.

APPENDIX A

LETTER NO. 92-WOB-331,
MATERIAL-NOT-CATEGORIZED-AS-WASTE SURVEY

This page intentionally left blank.

Department of Energy

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

9206157B

AUG 25 1992

92-WOB-331

President
Westinghouse Hanford Company
Richland, Washington

Dear Sir:

MATERIAL-NOT-CATEGORIZED-AS-WASTE (MNCAW) SURVEY

Attached is a questionnaire from the U.S. Department of Energy, Headquarters, EM-331 regarding storage of MNCAW. Please complete the questionnaire for each type of MNCAW in accordance with the guidance provided in the enclosure. EM-331 is planning to visit Richland in September to review and discuss this issue. This information will be used for determining future waste streams, negotiating with U.S. Environmental Protection Agency, and to develop guidance for handling such material complex wide.

Please return the completed questionnaire to me by September 18, 1992. If you have any questions, please contact Dennis Claussen of my staff on 372-0938.

Sincerely,

A handwritten signature in cursive script, appearing to read "June M. Hennig".

June M. Hennig, Director
Waste Management Division

WMD:DWC

Attachment

cc w/att:
M. M. McCarthy, WHC
J. L. Deichman, WHC
J. H. Roecker, WHC

INSTRUCTIONS FOR COMPLETING MATERIALS-NOT-
CATEGORIZED-AS-WASTE DATA INPUT FORMGeneral Instructions

The appropriate person to respond to this survey is the owner of the material, not necessarily the manager of the storage unit. The material owner should complete this questionnaire with assistance from site waste management personnel on the RCRA questions. Complete each questionnaire based on available information and data (e.g.; design specification information, analytical results from testing the materials, inventories, etc.) and your knowledge of the materials or processes involved. Complete one form for each type of material currently in storage at your site that is intended for future reuse or recovery. Information is requested on:

- o spent nuclear fuel including the assembly hardware if intact (meaning that the assembly hardware is stored together with the fuel), however the fuel/assembly may be damaged (e.g.; bent, warped, split, melted). Also include fuel debris (such as from Three Mile Island) and experimental test fuel pins.
- o reactor materials (materials which have been used in a nuclear reactor that are now in storage outside of the reactor building; e.g.; sodium coolant, core blanket assembly, poison elements)
- o Program accountable materials that also are one of the following:
 - nuclear scrap (use COEI Codes 712-729)
 - material in-process in shutdown facilities (e.g.; RL Pu Finishing Plant)
 - radioactive compounds (chemical compounds such as uranyl nitrate, uranium hexafluoride, and thorium nitrate that are made up of two or more elements chemically bonded together, where at least one of the elements is also a radioisotope)
 - inherently non-nuclear materials such as lithium
- o scrap and excess lead such as used for shielding
- o electronics assemblies (do not include computers and other electronics equipment that may be excessed)
- o research materials that are radioactively contaminated and/or not commercially available
- o process chemicals from shutdown facilities (e.g.; acid for Purex)
- o scrap metal that is not being recycled
- o explosives

Please exclude:

- o program accountable materials that are:
 - product forms (e.g.; special metal and >85% Pu oxide and uranium oxide)

- in-process in active facilities
- depleted uranium, normal uranium, uranium in cascades, Neptunium 237, Plutonium 238 and 242, Americium 241, Cesium, Californium, Berkelium
- o commercial products except those whose shelf life has expired
- o materials that are currently being sold to a recycler (e.g.; lead acid batteries, scrap metal)

Provide additional comments where necessary to adequately explain your answers. Provide all information in an unclassified form.

For answers to technical questions on how to complete this survey and what materials should be included, please contact Coreen Casey of the Radioactive Waste Technical Program at 208-526-4286.

I. Contact Information

1. DOE Field Office	Give the name of your operations office (e.g.; Albuquerque, Chicago, Idaho etc.)
2. DOE Site	Give the name of your DOE site (e.g.; Argonne-West, Los Alamos, Savannah River, etc.)
3-5.	Self explanatory.

II. Material Identification and Characterization Information

1. Unique Common Name	Provide a unique common name by which the material is referred at your site. Combine materials where the physical form of the material is the same and the materials are to be used in the future in the same application or for the same purpose.
2. Was this material reported in the first Materials Not Classified As Waste Survey?	Was this material reported in the survey that was sent to the sites in September 1990 under DOE Undersecretary John Tuck's signature? Circle Yes, No, or Unknown.
2a. Common Name	If the answer to 2. was Yes, give the material's common name that was reported in that survey if known.
3. Describe the physical form and use	Provide a detailed description of what the material is and its physical form. If the material is a product or byproduct of a production process, describe the process. Describe the materials primary application such as R&D or production.
3.a Commercially Available	Is the material available from a commercial manufacturer (i.e.; off the shelf)?
4. Radioactive Category	If this material were to be discarded, what would be the applicable radioactive category? Circle only one category. If more than one category is applicable to a material, complete a separate data form for each. Circle Nuclear Fuel/Fuel Scrap if the material is spent fuel, fuel debris, or irradiated experimental test fuel pins.

If radioactive, is the material contact- or remote-handled? |
| 5. Hazardous Components | Even though these materials are not waste, and therefore, are not considered to be subject to |

RCRA, answer this question as if the material were waste.

Assume no regulatory exclusions apply if this material were waste. Answer Yes if the material has any hazardous components other than those created through irradiation. Hazardous characteristics and materials that are specifically listed as hazardous wastes are identified in 40 CFR 261.

a. If the answer to question 5 is Yes, identify the constituent(s) that would cause the material to be RCRA hazardous.

b. If the answer to question 5 is Yes, circle all applicable RCRA categories per 40 CFR 261.

Ignitable (D001): Liquid with a flash point less than 60°C; or not a liquid, but capable of spontaneous combustion; or an ignitable compressed gas; or an oxidizer. (40 CFR 261.21)

Corrosive (D002): Aqueous with a pH ≤ 2 or ≥ 12.5 ; or corrodes steel at a specified rate. (40 CFR 261.22)

Reactive (D003): water reactive; reacts to produce cyanide or sulfide gases; explosive; and/or other properties specified in 40 CFR 261.23.

Toxicity Characteristic (D004-D043): See 40 CFR 261.24 for a list of contaminants and regulatory levels.

Listed (F's, K's, P's, U's): Wastes that are specifically listed in 40 CFR 261.31-33.

6. Radioactive compound

If the material is a radioactive compound, does it exhibit a hazardous characteristic that is solely attributable to the radionuclide itself? An example is uranium tetrafluoride which is corrosive.

A radioactive compound is defined as a chemical compound (as opposed to a solution, mixture, or radioactively contaminated solid) such as uranyl nitrate, uranium hexafluoride, and thorium nitrate that are made up of two or more elements chemically bonded together, where at least one of the elements is also a radioisotope.

7. PCB's Circle Yes, if the material contains greater than 50ppm polychlorinated biphenols (PCB's).
8. DOE Program Office Indicate which DOE Program Office currently holds the material.
- DP: Defense Programs
 NE: Nuclear Energy
 ER: Energy Research
 EM: Env Restoration and Waste Management

III. Justification for Holding Material

1. Held for Future Use Circle Yes if the material is being held for a future use even if processing or recovery is needed before it can be used.
- a. Describe what the material will be or could be used for. Provide as much detail as possible.
- b. The estimated date when the material will be used. Do not leave this question blank, provide your best guess if you do not know.
- c. Describe what processing and/or material recovery is required before the material can be used.
2. Disposition Determination Circle Yes if the material is awaiting disposition determination.
- a. Describe what the proposed disposition determination is expected to be (e.g.; disposal, transfer to another site)
- b. Who needs to make the determination (e.g.; DOE-HQ, Field Office, Westinghouse management)
- c. Provide an estimated date when this decision is expected to be made.
3. Held For Other Reasons Circle Yes if the material is being held for other than future use or disposition determination
- a. Describe why the material is being held rather than disposed of.

IV. Inventory Information

1. Quantity in Storage Provide the estimated quantity of this material in storage at the most recent inventory. If the quantity is not known, provide your best estimate even if you provide a range such as "less than 1 m". Do not leave this question blank.
2. Storage Unit If available, identify by name and building number, the unit where the material is stored. This information is needed only to more clearly document for future reference what materials are grouped onto one form.
3. First Date Material In Storage To the best of your knowledge, when was the material on this form first put in storage. Provide an estimate if the precise date is not known. This question refers to the first date that the material that is currently in storage was placed there, not the date when this type of material was first put into storage.
4. Most Recent Date Material In Storage To the best of your knowledge, when was the latest date this material has been put into storage.
5. Removed From Storage To the best of your knowledge, when was the most recent date this type of material was removed from storage and used for its intended purpose or discarded. The purpose of this question is to define how often this material is used.

V. Information on Specific Material Types

Complete this section only if the material is spent/irradiated nuclear fuel, lead (such as used for shielding), or nuclear scrap or residues.

1. Lead Categories If the material is lead, circle the letter of the category(s) that best describes the material. Indicate the length of time the material has been in storage (estimate if not known). If more than one category is chosen, or the material on the form is made up of more than lead solids, provide the volume of lead in cubic meters for each category.
2. Spent/Irradiated Fuel If the material is spent or irradiated fuel or fuel debris (such as from TMI), circle the letter of the category that best fits the material. Circle only one.

3. Description of Spent Fuel Provide additional information on each type of spent fuel. If the information is classified, indicate "CLASS" in the appropriate blank.
- a. Reactor name (e.g.; Peachbottom, EBR-II)
 - b. Reactor type (e.g.; boiling water reactor, pressurized water reactor)
 - c. Fuel type (e.g.; UZrH, U-Mo)
 - d. Fuel enrichment (%U-235 to U-238 in unirradiated fuel)
 - e. Cladding (e.g.; stainless steel, zirconium)
4. Nuclear Scrap/Residue Circle Yes if the material is nuclear scrap or residue and fits the regulatory definition of "scrap metal".

NOTE: Complete one form for each type of material in storage at your site that is intended for future reuse or recovery. Refer to the instructions for materials to be excluded.

I. Contact Information

1. DOE Field Office: _____
2. DOE Site: _____
3. Prepared by: _____
4. Phone Number: _____
5. Date Prepared: _____

II. Material Identification and Characterization Information

NOTE: Provide all information in an unclassified form.

1. Unique Common Name: _____
2. Has this material reported in the first Materials Not Classified As Waste survey?

Yes No Unknown

2a. If yes, what was the common name? _____

3. Provide a detailed description of what the material is, its physical form and use: _____

3a. Is this material commercially available? Yes No Unknown

4. If this material were determined to be waste, what would be the radioactive category of the material? (Circle only one.)

HLW TRU LLW Nonradioactive Nuclear Fuel/Fuel Scrap

MATERIALS-NOT-CATEGORIZED-AS-WASTE DATA INPUT FORM

If radioactive, circle the applicable radiation level indicator

Contact-Handled Remote-Handled
(< 200 mrem/hr) (≥ 200 mrem/hr)

5. Does this material contain any RCRA hazardous component(s) other than those created through irradiation?
Yes No Unknown

a. If yes, what constituent(s) in the material would cause it to be potentially RCRA hazardous? (e.g., lead, cadmium, trichloroethylene, explosives)

b. Circle the RCRA categories applicable to this material. (Circle as many as apply.)

Ignitable Corrosive Reactive TC Listed

6. Is this material a radioactive compound that exhibits a hazardous characteristic that is solely attributable to the radionuclide itself? (see instructions for a definition of "radioactive compound")
Yes No

7. Does the material contain PCB's in concentrations greater than 50ppm? Yes No Unknown

8. Circle the DOE Program Office that currently holds the material.

DP NE ER EM Other

MATERIALS-NOT-CATEGORIZED-AS-WASTE DATA INPUT FORM

III. Justification For Holding Material

1. Is this material being held for future use? Yes No
If the answer is yes, provide answers to the following. If the answer is no, go to question 2.

a. Describe what the use is.

b. Provide an estimated date when the material will be used (month/year).

c. Describe any processing or recovery needed before the material could be used. Include any necessary decontamination.

d. Are the necessary facilities currently available to process the material? Yes No

Go to Section IV.

2. Is the material awaiting disposition determination? Yes No
If the answer is yes, provide answers to the following. If the answer is no, go to question 3.

a. What is the proposed disposition?

b. Who needs to make the disposition decision?

c. Provide an estimated date when the decision is likely to be made.

Go to Section IV.

3. Is the material being held for some other reason? Yes No
a. If question 3 is yes, describe why the material is being held.

Comments:

IV. Inventory Information

1. Provide the quantity of the material in storage. If the quantity is not known, provide a best estimate in the requested units. (Metric tons uranium (MTU) for spent fuel, cubic meters for all other materials)

34

or

MTU

- 2. Where is this material stored?**

[illegible][illegible]

3. Provide the first date that the material was placed into storage (month/year) _____
4. Provide the most recent date that the material was placed into storage (month/year) _____
5. Provide the most recent date that this material was removed from storage and used for its intended purpose or discarded (month/year). _____

V. Information on Specific Material Types (Complete this section only if the material is spent nuclear fuel, lead solids, or nuclear scrap/residues)

Note: The following information is for use by the Office of Environment, Safety and Health in their discussions with EPA on certain mixed waste and materials management issues. Following the resolution of these issues, EII will prepare DOE-wide policies as appropriate. The information will be used for discussion purposes only.

1. If the material is lead (such as would be used for shielding), circle the letter of the category that best fits the material. If more than one category applies, indicate the volume (m3) of lead in each applicable category. If category a, b, or c is chosen, indicate the length of time that the material has been in storage. If category "e" is chosen, provide an explanation.

a. Unused lead in storage for direct use. - This is unused, raw material.
How long has this lead been in storage? _____

b. Used lead in storage for direct reuse in identified applications or where there is reasonable expectation for reuse. - This is used lead for which specific reuse applications have been identified. It does not require decontamination, reclamation, or processing (other than for retrofitting purposes) in order to be reused.
How long has this lead been in storage? _____

c. Used lead in storage for reuse in identified applications, or where there is a reasonable expectation for reuse, but which requires decontamination, reclamation, or processing by identified and available technologies. - This is used lead for which specific reuse applications have been identified. No processing other than decontamination and the changes necessary for retrofitting, is required for reuse.
How long has this lead been in storage? _____

d. Used (contaminated) lead in storage for potential reuse for which the application is not identified or where there is not reasonable expectation for reuse.

e. The lead does not fit into any of the above categories. Explain: _____

2. If the material is spent or irradiated fuel, circle the letter of the category that best fits the material. If category "c" is chosen, provide an explanation. Circle only one category.

- a. Fuel produced and used for primary purposes other than the production of special nuclear material (e.g., power generation, research and development) but now having an identified additional use (e.g., separations, testing and/or research).
- b. Fuel produced for primary purposes other than the production of special nuclear material (e.g., power generation, research and development) and having no currently identified use or means of processing. - Much of this fuel has historically been regarded as feedstock but lacks identified applications and/or a means of processing. It must be stored in accordance with DOE orders pending direction for final disposition.

c. Fuel does not fit into any of the above categories. Explain:

3. If the material is spent fuel, answer the following questions. If the material is not spent fuel, go to question 4. (Do not provide any classified information.)

- a. What is the name of the reactor the fuel came from? _____
- b. What is the reactor type (e.g.; BWR, PWR)? _____
- c. What is the fuel type? _____
- d. What is the fuel enrichment? _____
- e. What is the cladding made of (e.g.; zirconium, stainless steel)? _____

4. If the material is nuclear scrap or residue, can it be considered recyclable scrap metal? (Scrap metal is defined in 40 CFR 261.1 as bits and pieces of metal parts or pieces that may be combined with bolts or solder.) Yes No

This page intentionally left blank.

APPENDIX B

**NUCLEAR MATERIALS LOCATED AT THE PLUTONIUM FINISHING PLANT
AS OF SEPTEMBER 15, 1992**

This page intentionally left blank.

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
Nitrate for conversion - vault						
F01	PRF nitrate product ^a	5	482.0	<7	No	No
F01	PUREX nitrate product ^a	77	3,222.6	<7	No	No
F01	PUREX nitrate product ^a	17	821.6	12	No	No
In-process reactive materials - gloveboxes						
B50	Nonprocess gloveboxes	2	1.3#	<7	No	No
C00	Nonprocess gloveboxes	6	3.6#	<7	No	No
		1	0.6#	7-12	No	No
C01	Nonprocess gloveboxes	8	4.2#	<7	No	No
		16	9.6#	8.5	No	No
C40	Nonprocess gloveboxes	1	0.6#	11.5	No	No
D01	Nonprocess gloveboxes	2	1.2#	<7	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
D02	Nonprocess gloveboxes	2	1.2#	<7	No	No
D03	Nonprocess gloveboxes	11	6.6#	<7	No	No
G00	Nonprocess gloveboxes	118	71.0	<7	No	No
		15	1.2#	7-12	No	No
G01	Nonprocess gloveboxes	1	0.6#	7-12	No	No
G02	Nonprocess gloveboxes	7	4.2#	<7	No	No
G40	Nonprocess gloveboxes	5	3.0#	<7	No	No
Residues requiring stabilization:						
E00	RMC reactive residues (calcium, fluorine)	37	23.2#	<7	No	No
C11	RMC fluoride residue	3	1.7#	<7	No	No
E05	PRF metal filters (CCl_4)	19	1.7#	<7	No	No
C01	PRF oxide residue	1	0.5#	<7	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C11	PRF fluoride residue (fluorine)	1	0.8#	<7	No	No
G00	PRF sludge and residues	57	42.8#	<7	No	No
C00	PRF oxalate residue	7	5.3#	<7	No	No
D01	Rags/packages - acid soaked (fluorine, CCl_4)	19	3.5#	<7	No	No
In-process - holdup						
F05	Plutonium nitrate in tanks	N/A	N/A	<7	No	No
	Hoods, lines, equipment, holdup	N/A	N/A	<7	No	No
Product forms - vaults						
Metal:						
A02	Fuel grade ^a	348	859.4	16-19	Yes	119.7 kg
Oxide:						
C02	Ceramic grade/certified ^a	424	583.8	16-17	Yes	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C01	PUREX product ^a	107	215.9	12-13	Yes	No
C01	Other fuel grade ^a	255	538.3	7-<19	Yes	No
C01	Power reactor grade ^a	197	295.5	>19	Yes	No
C01	Licensed facility origin plutonium ^a	60	116.3	15-18	Yes	59.3 k
Scrap/defense programs - vaults						
ANSI scrap code/description:						
Rocky Flats scrap:						
C01	Oxide - low fired	887	1,456.7	<7	Yes	No
C02	Oxide - high fired	5	5.0	<7	Yes	No
C01	Oxide - low fired	52	89.4	<7	Yes	Yes/TRR
		--	23.4	7.1	Yes	Yes/TRR
C02	Oxide - high fired	15	12.0	<7	Yes	Yes/TRR

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
G03	Ash - stabilized	383	471.4	<7	Yes	Yes/TRR
G03	Ash - to be stabilized	44	51.3	<7	No	Yes/TRR
Hanford Site and Research and Development Program scrap:						
Plutonium (not mixed with uranium or thorium):						
A00	Metal - nonconforming	3	4.6	<7	No	No
		3	3.0	10	No	0.4 kg
A01	Metal - clad	1	0.8	<7	No	No
A02	Metal - impure	1	1.5	<7	Yes	No
		2	2.6	15-17	Yes	1.8 kg
		1	1.4	40	Yes	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
B00	Alloy - nonconforming	1	2.0#	<7	No	No
		6	7.2	7-19	No	0.8 kg
		2	2.0	>19	No	No
B02	Alloy - impure	16	19.8	<7	No	No
		8	8.2	9-14	No	No
		59	58.1#	>19	No	5.3 kg
B03	Alloy for oxidizing	1	0.6	<7	No	No
B04	Alloy composite	1	0.6	7	No	No
C00	Compounds - nonconforming	44	48.2#	<7	No	No
		3	2.2#	7-13	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C01	Oxides - low fired	566	556.0	<7	Yes	No
		134	129.5#	7-19	Yes	19.1 kg
		14	13.2	>19	Yes	No
C02	Oxides - high fired	9	9.6	<7	Yes	No
		4	3.5	8-17	Yes	0.1 kg
C03	Oxides - with beryllium	1	0.5#	21	(1)	No
C11	Tetrafluoride (PuF ₄)	1	0.4	8	(1)	No
		2	1.8	22	(1)	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % 240Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C30	Encapsulated compounds	2	0.9#	<7	(1)	No
		3	2.4	7-9	(1)	No
		1	0.7#	24	(1)	0.1 kg
D00	Combustibles - nonconforming	1	1.3	11.5	No	0.1 kg
D01	Combustibles - general	1	0.7#	<7	No	0.3 kg
Plutonium (not mixed with uranium or thorium):						
D02	Plastics - nonpolyvinyl chloride	1	1.4	<7	No	No
		200	160.5	8-18	No	No
D04	Graphite	1	0.7#	<7	(1)	No
E01	Plutonium contaminated metal	1	0.9	<7	(1)	No
E04	Graphite	1	0.7	<7	(1)	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
F00	Solutions - nonconforming	81	4,643.4#	<7	No	No
		24	1,375.8#	11-12	No	No
		1	57.3#	42	No	No
F01	Solutions - nitrate	3	128.8	<7	No	No
F02	Solutions - chloride	4	180.0#	<7	No	No
		15	675.0#	7-12	No	No
F03	Solutions - oil and organic	2	220.0#	12	No	No
F04	Solutions - caustic (basic)	16	720.0#	11.5	No	No
G00	Residues - nonconforming	28	28.0#	<7	No	No
		23	23.0#	11-18	No	3.8 kg
		4	3.4	>19	No	No
G02	Residues - sludges	3	2.1#	<7	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
G03	Residues - incinerator ash	109	105.5#	<7	No	No
		6	6.0#	7-10	No	No
G05	Residues - reduction process	255	253.4#	<7	No	No
		10	17.1	7-13	No	No
F05	Solutions - filtrate	104	7,445.0	<7	No	No
Plutonium with depleted uranium (plutonium - depleted uranium):						
B41	Alloy - plutonium-uranium-molybdenum	5	13.4	9-13	(1)	No
		7	25.0	>19	(1)	10.2 kg
C40	Compounds	8	9.9	<7	(1)	No
		406	581.5	8-13	(1)	50.5 kg

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C41	Oxides - low fired	27	29.6#	7-12	(1)	No
		31	84.4#	>19	(1)	3.8 kg
C43	Oxides - high fired	5	3.0#	<7	Yes	No
		48	75.9	7-19	Yes	4.5 kg
		1	0.7#	>19	Yes	No
D40	Combustibles	22	24.9	8.2	No	1.1 kg
F40	Solutions	40	98.5#	<7	No	No
		12	31.1#	22.7	No	20.0 kg
G40	Residues	3	2.9	12	No	1.3 kg
		1	0.6	22	No	No
Plutonium with normal uranium (plutonium - normal uranium):						
B50	Alloy	2	3.6	<7	(1)	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C50	Compounds	38	33.4#	12	(1)	4.8 kg
C51	Oxides - low fired	20	48.4#	18.6	Yes	6.4 kg
		28	66.8#	24.1	Yes	No
C52	Oxides - high fired	1	0.6	5.5	Yes	No
		106	190.1	7-19	Yes	3.5 kg
		22	43.4	>19	Yes	No
D50	Combustibles	1	0.6	9.4	No	No
F50	Solutions	7	350.0#	12	No	No
Plutonium with enriched uranium (plutonium - enriched uranium):						
B70	Alloy	4	6.4	<7	(1)	No
		9	3.8	7-10	(1)	0.5 kg

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C70	Compounds	51	66.3#	<7	(1)	No
		222	233.6#	7-19	(1)	26.4 kg
		3	3.1	>19	(1)	No
D70	Combustibles	2	1.1	8, 12	No	0.1 kg
E50	Noncombustibles	4	3.0	7-11	No	No
F70	Solutions	38	1,900.0#	12	No	No
		4	200.0#	<7	No	No
G70	Residues	1	0.4#	<10	No	No
Plutonium with thorium (plutonium-thorium, plutonium-thorium-uranium):						
B80	Alloy	1	2.1	16	(1)	1.6 kg
F80	Solutions	5	250.0#	<7	No	No
		4	200.0#	8	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
Scrap/nuclear energy - vaults						
COEI mainly plutonium-thorium mixed oxides:						
C02	Oxides - high fired	8	7.9	13-19	Yes	3.1 kg
		3	2.7	>19	Yes	1.5 kg
C03	Oxides - with beryllium	3	2.6	11-14	Yes	0.1 kg
C11	Tetrafluoride (PuF ₄)	1	0.6	22	Yes	0.1 kg
C52	Oxides - high fired	30	39.1	8-19	Yes	4.6 kg
		8	11.3	>19	Yes	1.9 kg
C43	Plutonium-depleted uranium oxides - high fired	53	52.4	11.5	Yes	4.8 kg
		4	2.3	>19	Yes	0.1 kg
C72	Oxides - high fired (plutonium-enriched uranium	304	396.9	8-18	Yes	50.8 kg
		39	59.1	>19	Yes	8.9 kg

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
C80	Compounds (plutonium-thorium)	6	8.2	12	Yes	0.9 kg
290	Fuel fabrication process:					
	C43, C52, C72	471	630.9	7-19	Yes	75.1 kg
	C02	77	62.9	7-19	Yes	No
	C72, C43	8	10.6	>19	Yes	No
291	Fabricated fuel:					
	C43, C52, C72, C80	14	15.4	12	Yes	No
	C52	4	2.6	22	Yes	No
454	Dioxides product:					
	C01	10	6.4	11-12	Yes	No
746	In other research and development usage:					
	C43	81	37.6	11-12	Yes	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
771	Samples and standards:					
	C02	5	5.6	7-19	Yes	No
	C43, C72, C52, C80	268	190.6	7-19	Yes	No
	C72	1	0.9	>19	Yes	No
	Model 60 shipping containers	64	29,030.0#	5-22	--	--
	Radial reflector shipping containers	6	10,000.0#	11-12	--	--
Samples and standards - vaults [Q]						
771	Samples and standards:					
	C01	41	24.4#	<7	(1)	No
	D02	1	0.6#	<7	(1)	No
	C01	119	94.8	7-19	(1)	No
	A00	5	4.2	>19	(1)	No
	C01	7	9.3	>19	(1)	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
A01	Metal - clad	2	2.9	10	(1)	No
C01	Oxides - low fired	20	15.4	<7	Yes	No
		24	17.2	7-12	Yes	No
C02	Oxides - high fired	1	0.7	6	Yes	No
		1	0.8	9	Yes	No
C43	Plutonium-depleted uranium oxides - high fired	1	0.8	7.2	Yes	No
		2	1.6	20	Yes	No
		1	0.8	9	Yes	No
F02	Chloride solution	1	50.0#	11.5	No	No
G00	Residues - nonconforming	10	4.7#	11.5	No	No
G05	Residues - reduction	11	8.8#	<7	No	No

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ²⁴⁰ Pu	Form shippable	Use RESTR	
Form of material	Location at PFP						
Chemical processing laboratory [P]							
771	Samples and standards:						
	A00		6	2.8	<7	Yes	No
			2	1.7	8-18	Yes	No
			1	0.5	>19	Yes	No
	(B13)		1	0.6	7.0	Yes	No
	(C01)		35	26.7	<7	Yes	No
			84	102.9#	7-19	Yes	No
			4	2.9	>19	Yes	No
	(C11)		2	7.1	<7	Yes	No
	(C43)		11	5.1	7-19	Yes	No
	(E03)		14	1.2#	7-19	Yes	No
	(G03)		11	9.7	<7	Yes	No
			8	7.1#	7-19	Yes	No
2			2.0	>19	Yes	No	

Nuclear Materials Located at PFP As of September 15, 1992.

Unirradiated plutonium		Number items	Quantity bulk (kg)	Wt % ^{240}Pu	Form shippable	Use RESTR
Form of material	Location at PFP					
D01	Combustibles - general	2	54.4#	<7	No	No
Pu-238	Standards	16	16.0#	--	Yes	No
Items/disposal problem - vaults						
Pu-NU	Nitride pellet fuel rods	3	45.0	11.4	Discard	No
At least one of three rods is Na or NaK bonded; no documentation of exact configuration. Radiography could determine structure. Rods cannot be discarded as waste until Na or NaK is removed. Received 2-10-72 from PNL; drum number 100-72-02-249.						
Pacific Northwest Laboratory NM items stored in Westinghouse Hanford Company DP vaults						
	PuO ₂ microspheres with pyrolytic carbon coating: 88-83-06-315 C25 88-83-06-314 C25 88-83-06-313 C25	3	4.8#	23	Discard	No
This material was received in 1983 from PNL for storage as scrap awaiting Savannah River CSMO evaluation. As coating on particles is refractory, CSMO instruction was to discard. The PNL did not have funds for disposal. Material is held on Nuclear Materials Management and Safeguards System project number E-AI-1500-000. The PNL has been requested to initiate action on making arrangements for disposition.						

*Not scrap items.

#Gross weights for some items were estimated.

(1) Inspection/analysis required to determine shipability.

NOTES:

- All fuel elements (finished, unfinished, and those in assemblies) are clad with Zircaloy-2.
- Drums and burial boxes containing plutonium waste identified for disposal have not been included.
- Bulk weight includes weight of container.
- Quantities shown in the Use Restr (Use Restricted Plutonium) column are the quantities of each material form allocated for restricted use.

In 1983 the following PNL materials were received by PFP for storage service only when PNL was required to remove them from their 303-C vault. The PNL has been requested to initiate action on making arrangements for disposition.

Nuclear material	Isotope wt%	COEI	WHC Item ID	Material Form
H-GE-0300-000				
2g DU	MT 16	746	88-83-06-316	UO ₃ N.B.S. Std.
26 g NU	MT 81	746	88-83-06-316	"
7 g EU	MT 33	746	88-83-06-316	"
9 g EU	78% U-235	746	88-83-06-316	"
10 g EU	90% U-235	771	88-83-06-319	Sample or std
765 g Pu	0.92% Pu-240	C11	88-83-06-317	PuF ₄
1 g Pu	10% Pu-240	C00	88-83-06-319	Sample or std
1 g Pu	5.8% Pu-240	C30	88-83-06-318	Sealed source
80 g Pu	7.5% Pu-240	C30	451-83-09-841	Sealed source

Nuclear material	Isotope wt%	COEI	WHC Item ID	Material Form
H-GE-0348-060				
35 g Pu	7.5% Pu-240	G03	A-28-1-37	--
47 g Pu	6.3% Pu-240	C10	0226-55	PuF ₃
51 g Pu	5.8% Pu-240	C10	0907-55	PuF ₃
H-29-9100-00N				
1,415 g EU	93% U-235	746	88-83-06-320	EU aluminum-clad rods
H-40-1001-06S				
2,777 g EU	10% U-235	637	S-1,BH-1,A-1, J-2	Sintered pellet
H-299-1000F				
3,784 g Pu/HU	7.6% Pu-240	745	12 items	192 rods 12 FL-10s

COEI code	%235	Quantity bulk (kg)	No. of items	Shippable present form	Comments
Building 234-5 (PFP)					
290	97.0	13.4	20	Yes	Material from 308
290	93.0	19.5	29	Yes	Material from 308
291	93.0	1.8	2	Yes	Material from 308
746	93.0	4.4	8	Yes	Material from 308
C72	93.0	2.8	5	Yes	Material from 308
290	20-43	4.9	9	Yes	Material from 308
746	27.0	1.0	2	Yes	Material from 308
291	30.0	1.7	2	Yes	Material from 308
771	28.0	1.2	1	Yes	Material from 308
290	<20.0	5.1	5	Yes	Material from 308
291	43.0	0.5	2	Yes	Material from 308
290	0.71	8.1	4	Yes	Material from 308
771	0.71	1.2	1	Yes	Material from 308
454	0.71	10.3	3	Yes	Material from 308
290	0.21	24.0	18	Yes	Material from 308
746	0.21	4.9	10	Yes	Material from 308
291	0.21	17.8 [#]	10	Yes	Material from 308
291	0.22	3.1 [#]	1	Yes	Material from 308
291	0.30	1.8 [#]	1	Yes	Material from 308

= Gross weights for some items were estimated.

This page intentionally left blank.

DISTRIBUTION

Number of copiesONSITE

3

U.S. Department of Energy,
Richland Field Office

D. W. Clausen	A5-21
R. F. Guercia	A5-21
J. M. Hennig	A5-21

2

Pacific Northwest Laboratory

J. P. Andre	P7-79
L. L. Fassbender	K6-61

30

Westinghouse Hanford Company

H. C. Boynton	N3-11
D. R. Duncan	H5-33
R. B. Dunn	S5-15
C. J. Garza	S6-19
K. A. Hadley	R3-56
W. H. Hamilton, Jr.	N3-10
D. G. Hay	T4-05
P. H. Jacobsen (10)	N3-13
W. G. Jasen	N3-13
M. M. McCarthy	N3-13
E. P. Mertens	H5-33
J. G. Riddelle	H5-33
R. J. Roberts	N3-13
R. L. Salley	R3-56
J. A. Seamans	N2-04
G. J. Warwick	T6-12
D. J. Watson	G6-56
N. P. Willis	N3-11
Information Release Administration	L8-07
Document Processing and Distribution (2)	L8-15

END

DATE
FILMED
10/01/93