ENGINEERING CHANGE NOTICE

1. ECN 639100

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	D. A. Pratt, Solid Waste Management, T4-03, 373-2464	[X] Yes [X] No (Pkg'd per DQO)	May 20, 1997
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	Waste Analysis Plan for the Low-Level Burial Grounds	Low-Level Burial Grounds	EQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-EN-WAP-002, Rev. 2 1/2	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

Change document WHC-SD-EN-WAP-002, Rev. 1 to HNF-SD-EN-WAP-002, Rev. 2 (attached).

This document was revised based upon the DQO process between RL, Ecology, FDH, and RFSH.

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[]	Environmental	[X]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

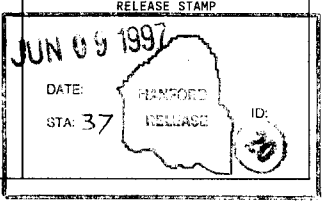
14b. Justification Details

Direct revision ECN, changes Rev. 1 to Rev. 2.

15. Distribution (include name, MSIN, and no. of copies)

See distribution sheet attached.

RELEASE STAMP



A-7900-013-2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 639100

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[ ] Yes	Additional	[ ] $ N/A	Additional	[ ] $ N/A	Improvement	[ ] N/A
[X] No	Savings	[ ] $	Savings	[ ] $	Delay	[ ] N/A

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD N/A	[ ]	Seismic/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Physics Procedure	[ ]
Operating Specification	[ ]	Interface Control Drawing	[ ]	Spares Multiple Unit Listing	[ ]
Criticality Specification	[ ]	Calibration Procedure	[ ]	Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Index	[ ]
Equipment Spec.	[ ]	Maintenance Procedure	[ ]	ASME Coded Item	[ ]
Const. Spec.	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec.	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[ ]	Electric Circuit Schedule	[ ]
OM Manual	[ ]	Operational Safety Requirement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]	Cell Arrangement Drawing	[ ]	Process Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Material Specification	[ ]	Purchase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac. Proc. Samp. Schedule	[ ]	Tickler File	[ ]
Environmental Report	[ ]	Inspection Plan	[ ]		[ ]
Environmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

Signature	Date	Signature	Date
Design Authority N/A		Design Agent	
Cog. Eng. D. A. Pratt	5/21/97	PE	
Cog. Mgr. R. M. Irwin	5/29/97	QA	
QA N/A D. L. Vance	5/29/97	Safety	
Safety N/A		Design	
Environ. K. M. McDonald	5/21/97	Environ.	
Other		Other	
G. C. Triner	5/30/97		
P. J. Crane	6/5/97		
B. M. Barnes	5/20/97	DEPARTMENT OF ENERGY	
D. G. Saueressig	5/28/97	Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION		ECN-639100
1. Identification Number: SWMFE-USQ-97-034	USQ SCREENING	Page 3 of 3

2. Title: Waste Analysis Plan for the Low-Level Burial Grounds

INSTRUCTIONS: Respond to each question and provide justification for each response. A restatement of the question does not constitute a satisfactory justification or basis. An adequate justification provides sufficient explanation such that an independent reviewer could reach the same conclusion based on the information provided [DOE 5480.21, 10.e.1].

QUESTIONS

1. Does the proposed change or occurrence represent a change to the facility or procedures as described in the Authorization Basis?
   [ ] N/A [X] No [ ] Yes/Maybe

   BASIS: The proposed change is to a Waste Analysis Plan which documents methods used to characterize and sample mixed waste disposed in the LLBG. This type of activity is described in WHC-SD-WM-SARR-028 Rev 2 section 3.2.1.

2. Does the proposed change or occurrence represent conditions that have not been analyzed in the Authorization Basis?
   [ ] N/A [X] No [ ] Yes/Maybe

   BASIS: SWBG Waste characterization and analysis activities are assumed for all wastes shipped to the SWBG facilities. A narrative description of the general process in given in 3.1.1.

3. Does the proposed change represent a test or experiment NOT described in the Authorization Basis that may affect the safe operation of the facility?
   [X] N/A [ ] No [ ] Yes/Maybe

   BASIS:

4. Does the proposed change or occurrence represent a change to the Technical Safety Requirements or a reduction in the margin of safety defined in the Technical Safety Requirements?
   [ ] N/A [X] No [ ] Yes/Maybe

   BASIS: This Waste Analysis Plan helps to ensure that requirements listed in WHC-SD-WM-TSR-001 Rev 1 Section 5.4.1 are implemented. No changes to TSRs are required.

USQE #1 D. A. Pratt (Print Name)

Signature Date: 5/21/97

USQE #2 ~~J. R. Rossen~~ BL Sletteine (Print Name)

Signature Date: 5/21/97

If there is a YES/MAYBE response to questions 1, 2, 3, or 4, then a USQ Evaluation must be completed.

The following guidance should be considered when completing this screening. This guidance should not be considered all-inclusive; additional factors may need to be considered depending on the nature of the proposed change.

Does the proposed change:

1) Modify, add, or delete a safety class function of a structure, system or component stated in the authorization basis?
2) Alter the design of a structure, system or component as described in the authorization basis?
3) Modify, add, or delete the description of operation, operating environment, or analyses of any system or component described in the authorization basis?
4) Modify, add, delete or conflict with any of the design bases stated in the authorization basis?
5) Conflict with the principle or general design criteria stated in the authorization basis?
6) Modify, add, or delete any plant design features described in the authorization basis?
7) Modify, add, or delete a flow diagram or facility drawing provided in the authorization basis?
8) Create the potential for new system or component interactions (e.g., seismic, electrical breaker coordination)?

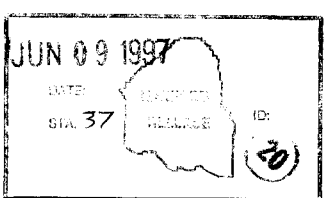
Waste Analysis Plan for the Low-Level Burial Grounds

Dean A. Pratt
Rust Federal Services of Hanford Inc., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: ~~N/A~~ 639100 UC: 2000
Org Code: 32540 Charge Code: A6Y01
B&R Code: EW3130020 Total Pages: ~~50~~ 53

Key Words: Low-Level Burial Grounds, mixed waste, waste acceptance, waste designation, waste characterization, QA/QC, sampling and analysis.

Abstract: This waste analysis plan (WAP) has been prepared for the Low-Level Burial Grounds (LLBG) which are located in the 200 East and West Areas of the Hanford Facility, Richland, Washington. This WAP documents the methods used to characterize, and obtain and analyze representative samples of waste managed at this unit.



Release Approval

6-9-97
Date

Release Stamp

Approved for Public Release

RECORD OF REVISION

(1) Document Number: HNF-SD-EN-WAP-002, Rev. 2

(2) Title

Waste Analysis Plan for the Low-Level Burial Grounds, HNF-SD-EN-WAP-002, Rev. 2

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT - 161194, 2-13-96		
1	Incorporated changes per ECN# 630806		
2 RS	Incorporated changes per ECN# 639100	DA Pratt	RM Irwin 4/6/97

CONTENTS

CONTENTS (cont)

FIGURES

TABLES

GLOSSARY

ALARA	as low as reasonably achievable
AWMP	alternative waste management plan
CAP	corrective action plan
COLIWASA	composite liquid waste sampler
CFR	Code of Federal Regulations
CWC	Central Waste Complex
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
HF	Hanford Facility
LDR	land disposal restriction
LLBG	Low-Level Burial Grounds
MSDS	material safety data sheet
PCB	polychlorinated biphenyl
PES	performance evaluation system
pH	negative concentration logarithm of the hydrogen-ion concentration
QA/QC	quality assurance and quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
RTR	real-time radiography
SWITS	solid waste information tracking system
SWMU	solid waste management unit
TRU	transuranic
WAC	Washington Administrative Code
WAP	waste analysis plan
WRAP 1	Waste Receiving and Processing 1
WSRd	waste specification record
°C	degrees Celsius

METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into metric units

If you know	Multiply by	To get
Length		
inches	25.40	millimeters
inches	2.54	centimeters
feet	0.3048	meters
yards	0.914	meters
miles	1.609	kilometers
Area		
square inches	6.4516	square centimeters
square feet	0.092	square meters
square yards	0.836	square meters
square miles	2.59	square kilometers
acres	0.404	hectares
Mass (weight)		
ounces	28.35	grams
pounds	0.453	kilograms
short ton	0.907	metric ton
Volume		
fluid ounces	29.57	milliliters
quarts	0.95	liters
gallons	3.79	liters
cubic feet	0.03	cubic meters
cubic yards	0.76	cubic meters
Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius

Out of metric units

If you know	Multiply by	To get
Length		
millimeters	0.0393	inches
centimeters	0.393	inches
meters	3.2808	feet
meters	1.09	yards
kilometers	0.62	miles
Area		
square centimeters	0.155	square inches
square meters	10.7639	square feet
square meters	1.20	square yards
square kilometers	0.39	square miles
hectares	2.471	acres
Mass (weight)		
grams	0.0352	ounces
kilograms	2.2046	pounds
metric ton	1.10	short ton
Volume		
milliliters	0.03	fluid ounces
liters	1.057	quarts
liters	0.26	gallons
cubic meters	35.3147	cubic feet
cubic meters	1.308	cubic yards
Temperature		
Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 UNIT DESCRIPTION

The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that are undertaken for waste accepted for disposal at the Low-Level Burial Grounds (LLBG), which are located in the 200 East and 200 West Areas of the Hanford Facility, Richland, Washington. Because dangerous waste does not include the source, special nuclear, and by-product material components of mixed waste, radionuclides are not within the scope of this documentation. The information on radionuclides is provided only for general knowledge. The LLBG also receive low-level radioactive waste for disposal. The requirements of this WAP are not applicable to this low-level waste.

1.1 DESCRIPTION OF PROCESSES AND ACTIVITIES

The LLBG are a land-based unit consisting of eight burial grounds located in the 200 East Area and 200 West Area. Seven of the eight burial grounds (218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, 218-W-5, and 218-W-6) are, or will be, used for the disposal of mixed waste and are subject to *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303. One burial ground (218-W-4B) is designated as a solid waste management unit (SWMU) (Figures 1-1 and 1-2).

The 218-E-10, 218-E-12B, 218-W-3A, 218-W-3AE, 218-W-4C, and 218-W-6 Burial Grounds are classified as landfills and the 218-W-5 Burial Ground is classified as a landfill and for greater-than-90-day container storage. The regulated portions of the LLBG cover a total area of approximately 49 hectares.

The 218-E-10 and 218-E-12B Burial Grounds are located in the 200 East Area. The 218-W-3A, 218-W-3AE, 218-W-4B, 218-W-4C, 218-W-5, and 218-W-6 Burial Grounds are located in the 200 West Area. The LLBG consist of various sizes and depths of lined and unlined disposal trenches. All mixed waste destined for disposal will meet land disposal restriction (LDR) requirements [WAC 173-303-140 and 40 Code of Federal Regulations (CFR) 268] or other regulatory alternatives. The lined trenches have leachate collection and removal systems. The less-than-90-day leachate collection tanks are operated in accordance with the generator provisions of WAC 173-303-200 and are not subject to this WAP.

Future trench development and configuration within a burial ground are subject to change as disposal techniques improve or as waste management needs dictate and will be subject to an approved permit modification in accordance with the Hanford Facility (HF) *Resource Conservation and Recovery Act* (RCRA) *of 1976* Permit (Ecology 1994). Mixed waste is disposed in lined or in unlined trenches in accordance with applicable LDR requirements.

The following provides a brief description and identifies the generic types of waste disposed in the LLBG. An electronic database, which can be

found within the LLBG operating organization, is maintained that documents each waste receipt, type of waste, and disposal location.

- The 218-E-10 Burial Ground (Figure 1-3) is approximately 36.1 hectares in size and began receiving waste in 1960. Examples of waste placed in this burial ground include failed equipment, rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-E-12B Burial Ground (Figure 1-4) is approximately 68 hectares in size and began receiving waste in 1967. Examples of waste placed in this burial ground include defueled reactor compartments (trench 94), low-level waste, and retrievable transuranic waste.

- The 218-W-3A Burial Ground (Figure 1-5) is approximately 20.4 hectares in size and began receiving waste in 1970. Examples of waste placed in this burial ground include ion exchange resins, failed equipment, tanks, pumps, ovens, agitators, heaters, hoods, jumpers, vehicles, accessories and post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-3AE Burial Ground (Figure 1-6) is approximately 20 hectares in size and began receiving waste in 1981. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste.

- The 218-W-4B Burial Ground (Figure 1-7) is approximately 3.5 hectares in size and began receiving waste in 1968. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, alpha caissons, and retrievable transuranic waste.

- The 218-W-4C Burial Ground (Figure 1-8) is approximately 20 hectares in size and began receiving waste in 1978. Examples of waste placed in this burial ground include contaminated soil, decommissioned pumps, pressure vessels, and post-August 19, 1987 RCRA and state-only designated mixed waste, and retrievable transuranic waste.

- The 218-W-5 Burial Ground (Figure 1-9) is approximately 37.2 hectares in size and began receiving waste in 1986. Examples of waste placed in this burial ground include rags, paper, rubber gloves, disposable supplies, broken tools, and post-August 19, 1987 RCRA and state-only designated mixed waste. This burial ground currently contains double-lined mixed waste trenches (trenches 31 and 34) (Figure 1-10). Trenches 31 and 34 also are designated as greater-than-90-day container storage. Waste placed in trenches 31 and 34 for storage purposes and eventual disposal predominately is macro-encapsulated long-length contaminated equipment and other containerized waste treated to meet LDR requirements. Adjacent to the double-lined mixed waste trenches are leachate collection tanks operated in accordance with the generator provisions of WAC 173-303-200. Examples of waste

to be placed in the double-lined mixed waste trenches include mixed waste that has been treated to meet LDR requirements (including containerized bulk waste), macro-encapsulated long-length contaminated equipment, etc.

- The 218-W-6 Burial Ground (Figure 1-11) is approximately 16 hectares in size, has not received any waste, and is reserved for future mixed waste disposal.

1.1.1 How Waste is Accepted, Moved, Processed, and Managed

The following sections describe the different types of information and knowledge for waste acceptance. The movement, processing, and management of waste at the LLBG is described in Chapter 4.0 of the *Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds* (DOE/RL-88-20).

1.1.1.1 Narrative Process Descriptions. The LLBG currently accepts mixed waste. All mixed waste is disposed in lined mixed waste trenches or other approved alternatives. Waste accepted either can be containerized or bulk solids. Typical onsite generating units include research laboratories, and chemical and nuclear reprocessing units. Waste also is accepted from decommissioning of structures, waste retrieval and cleanup, waste sampling, etc. Typical offsite generators include research laboratories, chemical and nuclear processing plants, test sites, etc. The onsite generating unit, offsite generator, treatment, storage, and/or disposal unit transferring waste to the LLBG will be hereafter referred to as the 'generator'.

Mixed waste that meets LDR requirements, as specified in 40 CFR 268 and WAC 173-303-140, is disposed in lined trenches with leachate collection and removal systems. The Hanford Facility is required to test certain mixed waste depending on the type of treatment standard to ensure that the waste or treatment residuals are in compliance with applicable LDR. Such testing is performed according to the frequency specified in this WAP.

Two types of mixed waste are disposed in the LLBG under exemption allowed by WAC 173-303-806: remote-handled mixed waste and other waste (e.g., defueled reactor compartments; refer to DOE/RL-88-20, Appendix 4D).

1.1.1.2 Types of Acceptable Knowledge. When collecting documentation on a waste stream or container, the LLBG operating organization must determine if the information provided by the generator is acceptable knowledge. Acceptable knowledge requirements could be met using the following types of information:

- Mass balance from a controlled process
- Material safety data sheet (MSDS) on unused chemical products
- Test data from a surrogate sample
- Analytical data on the waste or a waste from a similar process

- A combination of two or more of the following:
  - Interview information
  - Logbooks
  - Procurement records
  - Validated analytical data
  - Radiation dose rate profiles
  - Procedures and/or methods
  - Process flow charts
  - Inventory sheets
  - Vendor information
  - Mass balance from an uncontrolled process (e.g., spill cleanup)
  - Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods).

If the information is sufficient to quantify constituents and/or characteristics as required by the regulations and unit specific acceptance criteria, the information is acceptable knowledge.

1.1.1.3 Description of Waste Profile System. The performance evaluation system (PES) is used to determine initial physical screening frequency of the generator. The PES provides a periodic status of an individual generator's performance for waste received. Also, the PES provides a mechanism for determining corrective actions and physical screening frequency adjustments when a problem has been discovered after waste has arrived at the LLBG.

1.1.1.3.1 Initial Physical Screening Frequency Determination. The initial physical screening frequency determination is based on the following general process.

- The LLBG operating organization reviews the waste profile information to determine if there is any misdesignated or inappropriately segregated waste. Based on this review, the LLBG operating organization identifies any concerns associated with the following:
  - documented waste management program
  - waste stream characterization information
  - potential for inappropriate segregation.

- Based on the identification of concerns during the review, the LLBG operating organization establishes an initial physical screening frequency for the new waste stream(s).

1.1.1.3.2 Monthly Performance Evaluation. The monthly performance evaluation is used to trend generator performance on a programmatic basis and is used to adjust the overall physical screening frequency. However, only a portion of the general waste streams could be affected by the monthly performance evaluation if substantial documentation can be provided to demonstrate that one or more general waste streams will not exhibit similar problems.

Conformance issues are documented during the pre-shipment review and/or verification. These conformance issues are tracked on a conformance report. The conformance report is used to complete the generator evaluation worksheet

(Figure 1-12). A generator receiving a score of 10 or greater has demonstrated less than satisfactory performance, and must be evaluated for corrective action determination.

1.1.1.3.3 Conformance Issue Resolution. Conformance issues identified during verification might result in a waste container that does not meet the LLBG waste acceptance criteria. If a possible conformance issue is identified, the following steps are taken to resolve the issue.

- LLBG operating organization personnel compile all information concerning the possible conformance issue(s).
- The generator is notified and requested to supply additional information to assist in the resolution of the issue(s). If the generator-supplied information resolves the issue(s), no further action is required.
- On resolution of the initial conformance issue, the generator provides a corrective action plan (CAP) that clearly states the reason for the failure and describes the actions to be completed to prevent a reoccurrence.
- The LLBG operating organization reviews the CAP and waste stream justification for adequacy.
- If a CAP is determined to be inadequate, the generator remains at a physical screening rate set by the LLBG operating organization.

1.1.2 Process for Reducing the Physical Screening Frequency

After a generator's frequency has been adjusted (e.g., poor performance or following initial frequency) the physical screening frequency can be reduced in accordance with the following criteria:

- The physical screening frequency is stepped down in a minimum of two steps based on the ability of the generator to quickly implement their CAP or demonstrate their ability to appropriately manage waste (as applicable)
- The reduction is determined during the monthly evaluation process; however, the following minimum criteria must be met before the reduction of the frequency:
  - Five containers from the streams in question must pass verification
  - The LLBG operating organization believes that there is adequate evidence that the CAP or new generator's waste management program has been implemented and is effective.

  NOTE: The LLBG operating organization could perform a generator visit to obtain documentation that the CAP has been fully implemented.

If the frequency was adjusted based on conformance issues, the CAP must be fully implemented before the generator is allowed to return to the minimum physical screening frequency.

1.1.3 Process Flow Diagram

Refer to Figure 1-13 for LLBG waste analysis plan flowchart.

1.1.4 Operating Conditions and Process Constraints

The following sections discuss the operating conditions and process constraints for the LLBG.

1.1.4.1 Operating Conditions. For information determined to be 'acceptable knowledge', the LLBG operating organization must determine if the information is adequate for management of the waste at the LLBG. Adequate acceptable knowledge is based on (1) general waste knowledge requirements, (2) LDR waste knowledge requirements, and (3) waste knowledge exceptions.

1.1.4.1.1 General Waste Knowledge Requirements. At a minimum, the generator must supply enough information for the waste to be managed at the LLBG. The minimum level of acceptable knowledge consists of designation data where the toxic constituents causing a waste number to be assigned are quantified and data are provided to address any operational parameters necessary for proper management of the waste in the LLBG.

1.1.4.1.2 Land Disposal Restriction Information Requirements. Waste can be placed in the LLBG only if the waste meets all applicable treatment standards. The LLBG operating record contains all information required to document that the appropriate treatment standards have been met. For waste that does not meet all applicable treatment standards, the waste is transferred to another TSD unit for proper disposition.

For the purposes of this WAP, only one representative sample is required to demonstrate compliance with a concentration-based treatment standard and the corroborative testing for the sample could be accomplished in the following manner.

- Generators could use onsite laboratories or offsite contract laboratories and must certify that the waste meets LDR requirements. The LLBG operating organization will use these analytical data to meet the requirements found in 40 CFR 268.7 and WAC 173-303-140(4).

- Generators could use an independent laboratory (independent meaning not part of the generator's management structure; contract laboratories are acceptable), or send a sample to the Hanford Site for laboratory testing. The generator must certify the waste meets LDR requirements.

1.1.4.1.3 Waste Knowledge Exceptions. The following waste knowledge exceptions have been developed to account for those instances when the generator cannot meet the general waste knowledge and LDR waste knowledge requirements of this WAP.

- Hazardous debris, as defined in WAC 173-303-040, that is managed in accordance with 40 CFR 268.45 (Debris Rule) is not required to be sampled. Management of debris in this manner does not depend on the quantification of constituents to meet federal and state-only LDR regulations. Hazardous debris meeting treatment standards in accordance with 40 CFR 268.45 also meets any state-only LDR in WAC 173-303-140(4).

- Waste that is retrieved from the LLBG could be transferred to an onsite TSD storage unit with only the necessary information to properly manage the waste at the unit.

Other exceptions should be brought to the attention of the LLBG operating organization for appropriate disposition.

1.1.4.2 Process Constraints. The process constraints for the LLBG consist of the following:

- Defining whether there is acceptable knowledge
- Acceptable knowledge is adequate for disposal
- Waste meets LLBG safety criteria [e.g., as low as reasonably achievable (ALARA) concerns, etc.].

1.2 IDENTIFICATION AND CLASSIFICATION OF WASTE

Mixed waste is acceptable for disposal in the LLBG except for the following waste types.

- Waste is not accepted for disposal when the waste contains free-standing liquid unless all free-standing liquid:

  - Has been removed by decanting, or other methods
  - Has been mixed with sorbent or stabilized (solidified) so that free-standing liquid is no longer observed
  - Has been otherwise eliminated
  - Container is very small, such as an ampule
  - Container is a labpack and is disposed in accordance with WAC 173-303-161 or 40 CFR 264.316
  - Is less than 1 percent of the volume of the waste or if the sorbent to potential liquid waste ratio is greater than 2 to 1.

  Free liquid is determined by SW-846, Method 9095 (Paint Filter Liquids Test) [WAC 173-303-140(4)(b) and 40 CFR 264.314(d)] only for waste that has the potential for free liquid formation.

- Gaseous waste is not accepted for disposal if the waste is packaged at a pressure in excess of 1.5 atmospheres at 20°C.

- Pyrophoric waste is not accepted for disposal. Waste containing less than 1 weight percent pyrophoric material partially or completely dispersed in each package is not considered pyrophoric for the purposes of this requirement.

- Solid acid waste is not accepted for disposal (WAC 173-303-140(4)(c)).

- Untreated mixed waste with greater than 10 percent dangerous organic/carbonaceous constituents is not accepted for disposal [WAC 173-303-140(4)(d)]. Paper, sawdust, wood, and other similar carbon-to-carbon bonded debris matrix items are not considered organic/carbonaceous constituents.

- Waste not meeting the applicable treatment standards is not accepted for disposal [40 CFR 268 and WAC 173-303-140(4)].

Untreated extremely hazardous waste is not accepted for disposal. Extremely hazardous waste that has been treated could be disposed in accordance with the Revised Code of Washington (RCW) 70.105.050(2). Mixed waste with constituents that could result in loss of liner integrity is not accepted in the LLBG. Table 1-1 provides a list of chemicals that have been shown to be incompatible with the liner (DOE/RL-88-20). Mixed waste with chemical constituents other than heavy metals, heavy metal salts, or those listed in Table 1-1 are evaluated on a case-by-case basis.

1.2.1 Dangerous Waste Numbers, Quantities, and Design Capacity

The Part A, Form 3, permit application for the LLBG identifies dangerous waste numbers, quantities, and the design capacity and is located in Chapter 1.0 of the LLBG dangerous waste permit application documentation (DOE/RL-88-20).

For waste that cannot be managed in accordance with the requirements set forth in this WAP, an alternative waste management plan (AWMP) could be submitted to the Washington State Department of Ecology (Ecology) for review. Because many activities associated with or necessary to support waste management projects readily would not be predictable, some flexibility in timeframes for submitting, reviewing, and completing waste management plans would be necessary. In general, the following schedules could be observed.

- Submit the AWMP to the Ecology Project Manager at least 120 days before the project is expected to begin. The cover letter must state that "no reply within 45 days constitutes approval".

- Ecology reviews and provides comments (if any) within 45 days after receiving the AWMP.

- If comments are received, comments will be resolved through project manager meetings or other workshops as agreed to by the U.S. Department of Energy, Richland Operations Office (DOE-RL) and Ecology. When the plan is resubmitted on resolution of Ecology's comments, the same review timeframes are applicable.

- If no comments are received from Ecology within 45 days after the AWMP is submitted, the plan is denoted as being approved.

These timeframes could be adjusted by mutual agreement to account for project-specific needs and priorities. The AWMP is reviewed to ensure the following.

- The project does not endanger human health and the environment.

- The course of action chosen is well justified.

On gaining written or automatic approval, the DOE-RL proceeds as described in the AWMP. Should the plan require revision due to unforseen circumstances, the DOE-RL will resubmit the plan before continuing. On conclusion of the project, the DOE-RL will supply Ecology with a report outlining the activities performed and the results of these activities. A determination also will be made if the WAP requires revision. Under most circumstances, it is expected that the AWMP will not result in the need to amend the WAP.

1.2.2 Unit-Specific Information

For a detailed description on processes, operations, and physical dimensions, refer to Chapter 4.0 of the Hanford Facility dangerous waste permit application LLBG documentation (DOE/RL-88-20).

1
2
3
4
5

This page intentionally left blank.

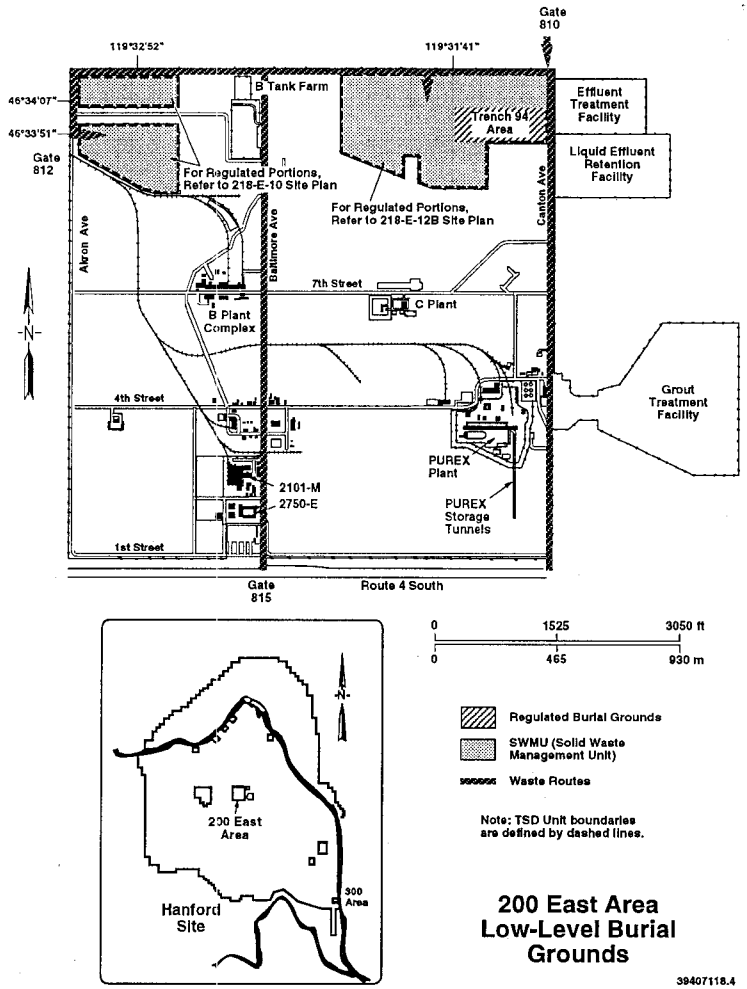


Figure 1-1. Locations of Low-Level Burial Grounds in the 200 East Area.

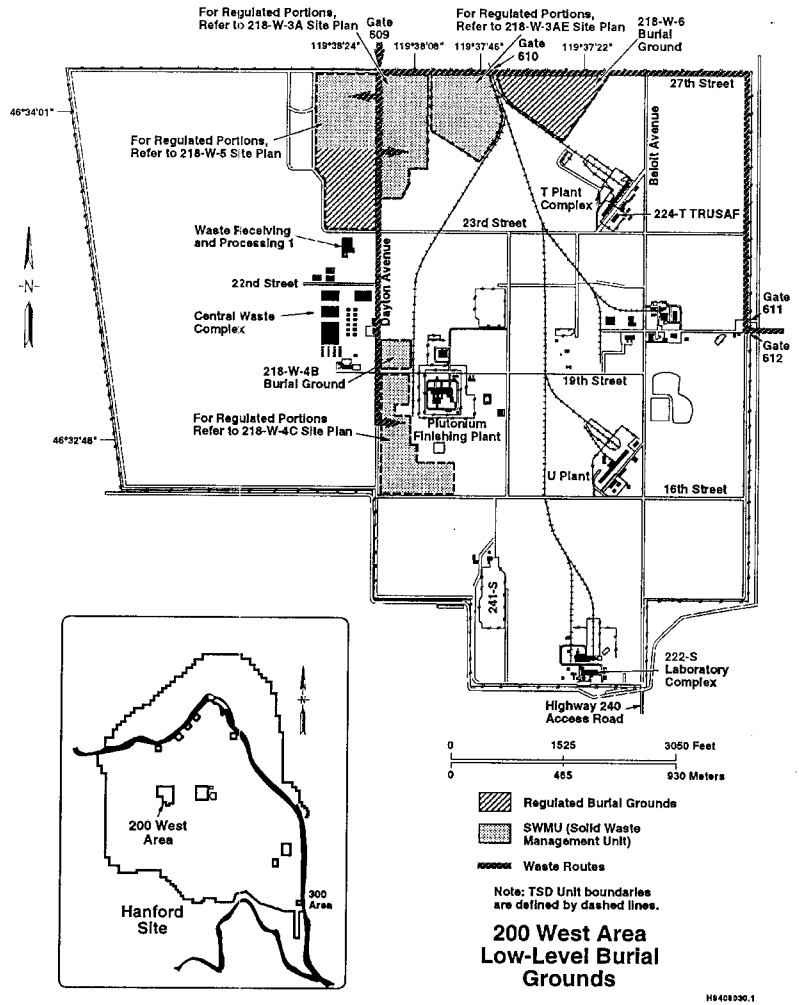


Figure 1-2. Locations of Low-Level Burial Grounds in the 200 West Area.

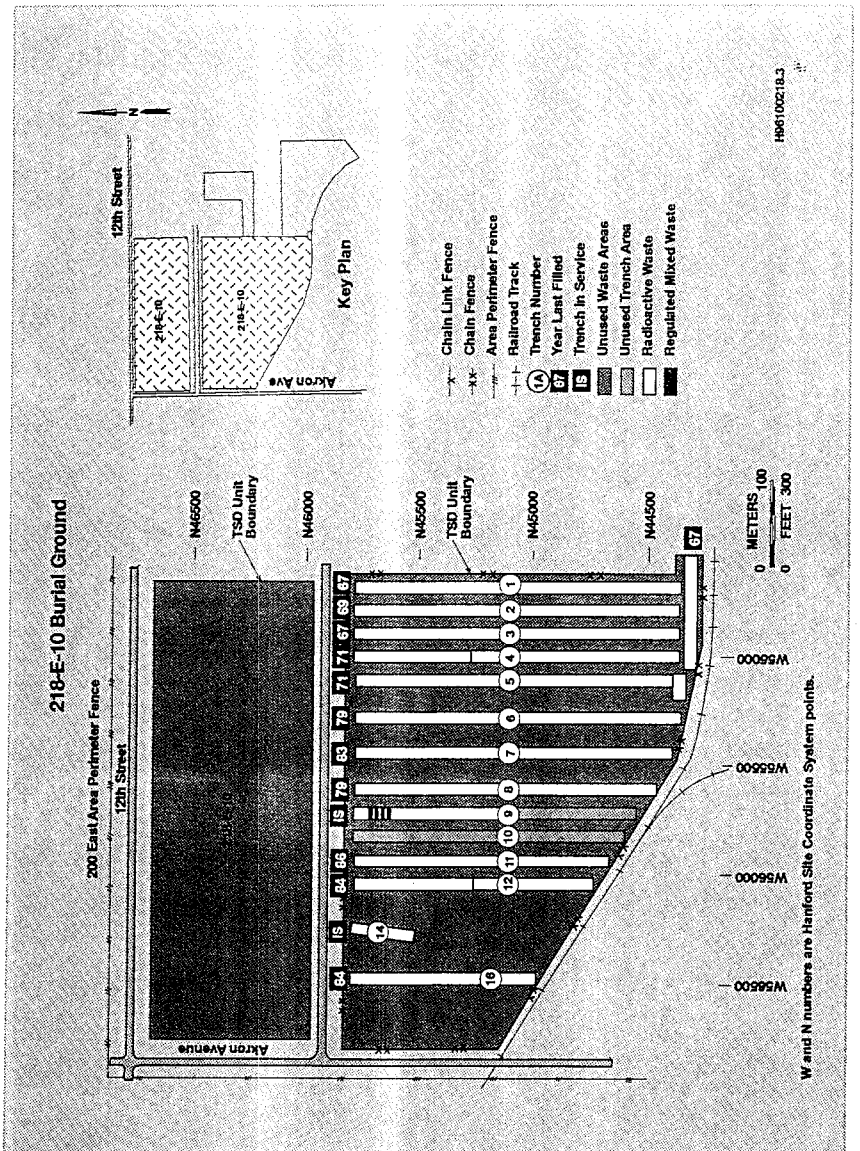


Figure 1-3. 218-E-10 Burial Ground.

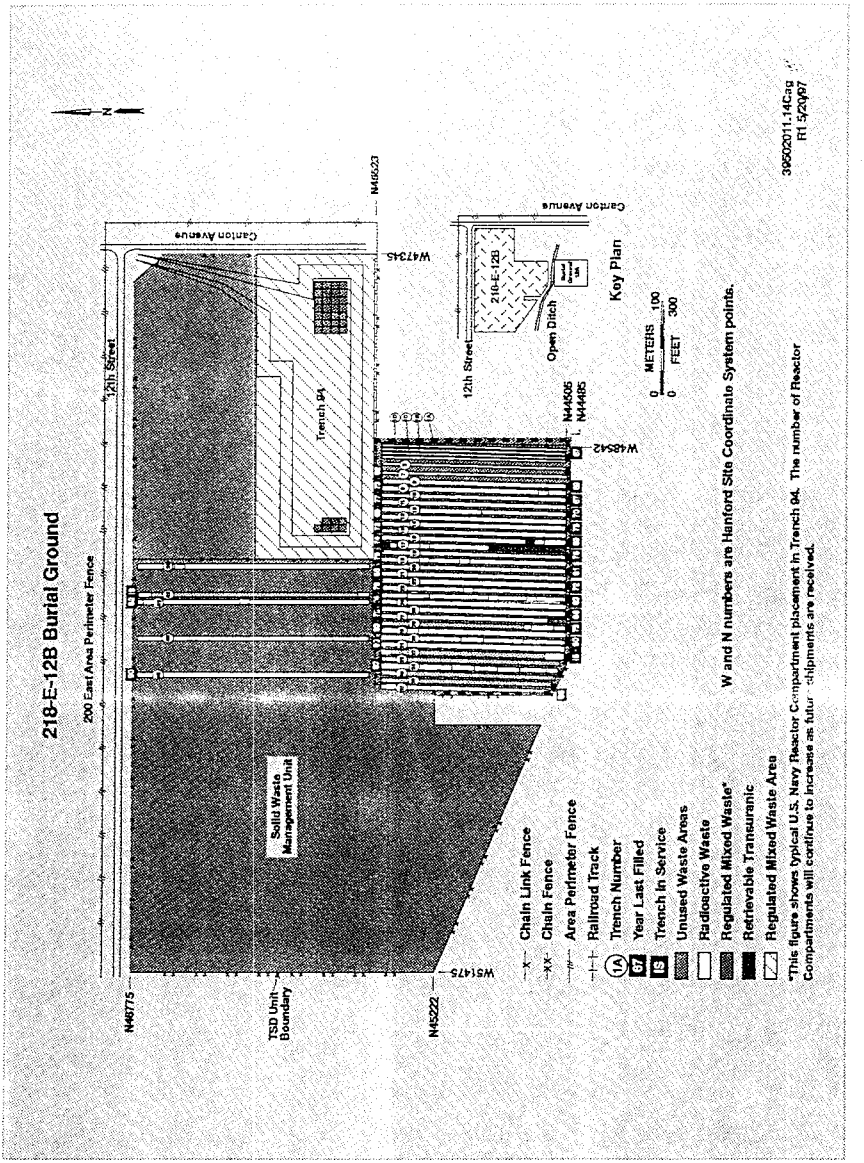


Figure 1-4. 218-E-12B Burial Ground.

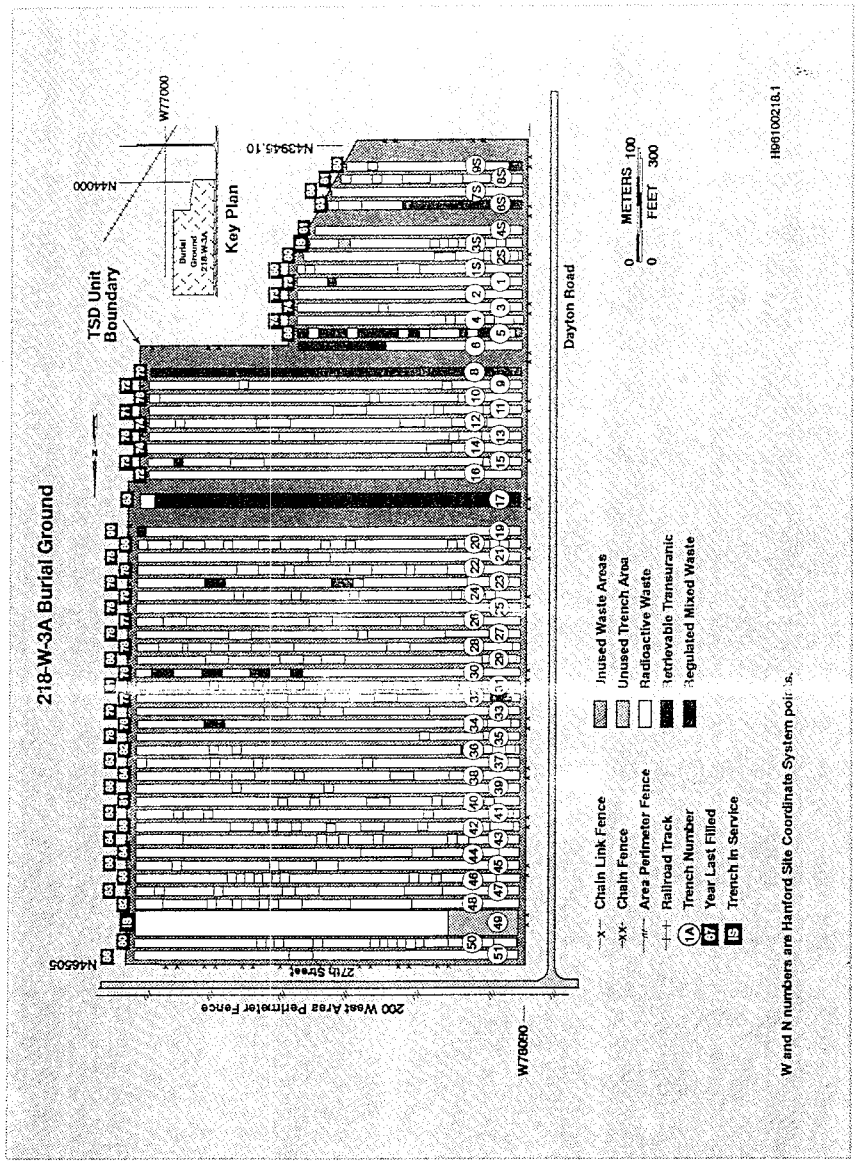


Figure 1-5. 218-W-3A Burial Ground.

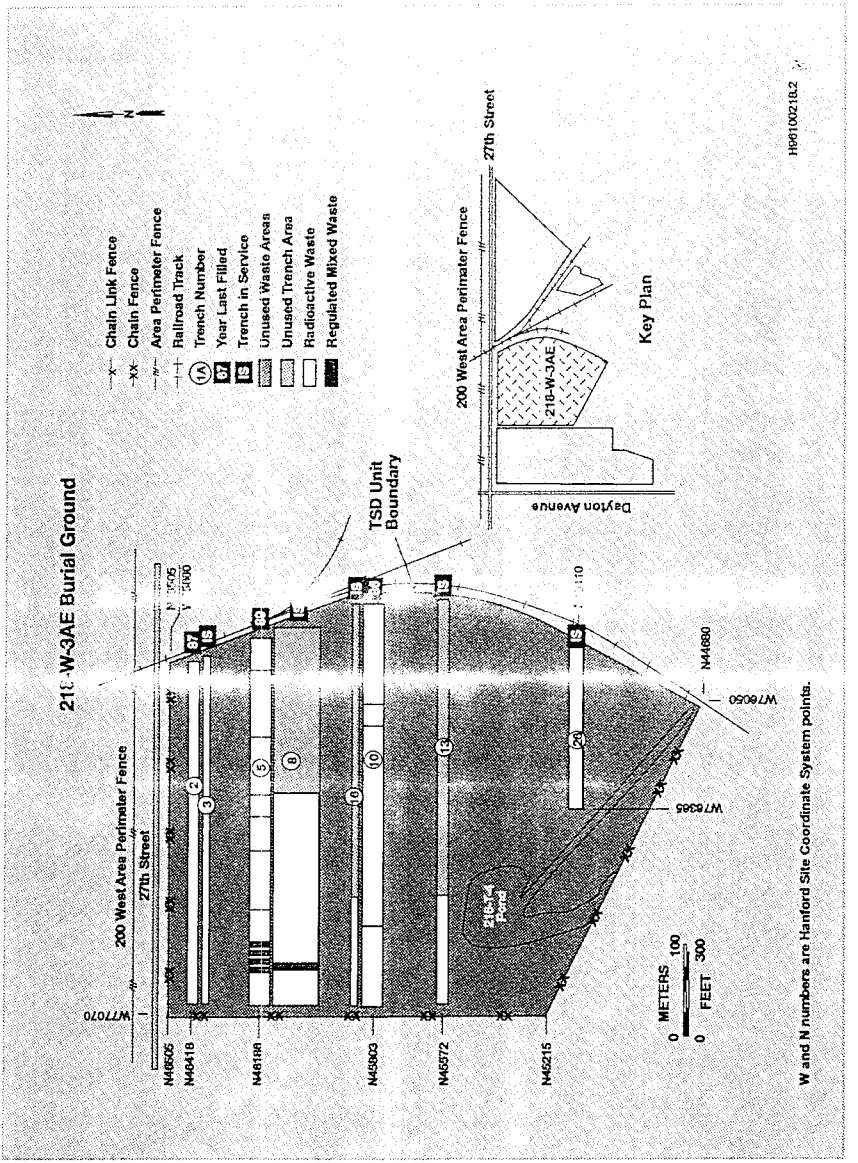


Figure 1-6. 218-W-3AE Burial Ground.

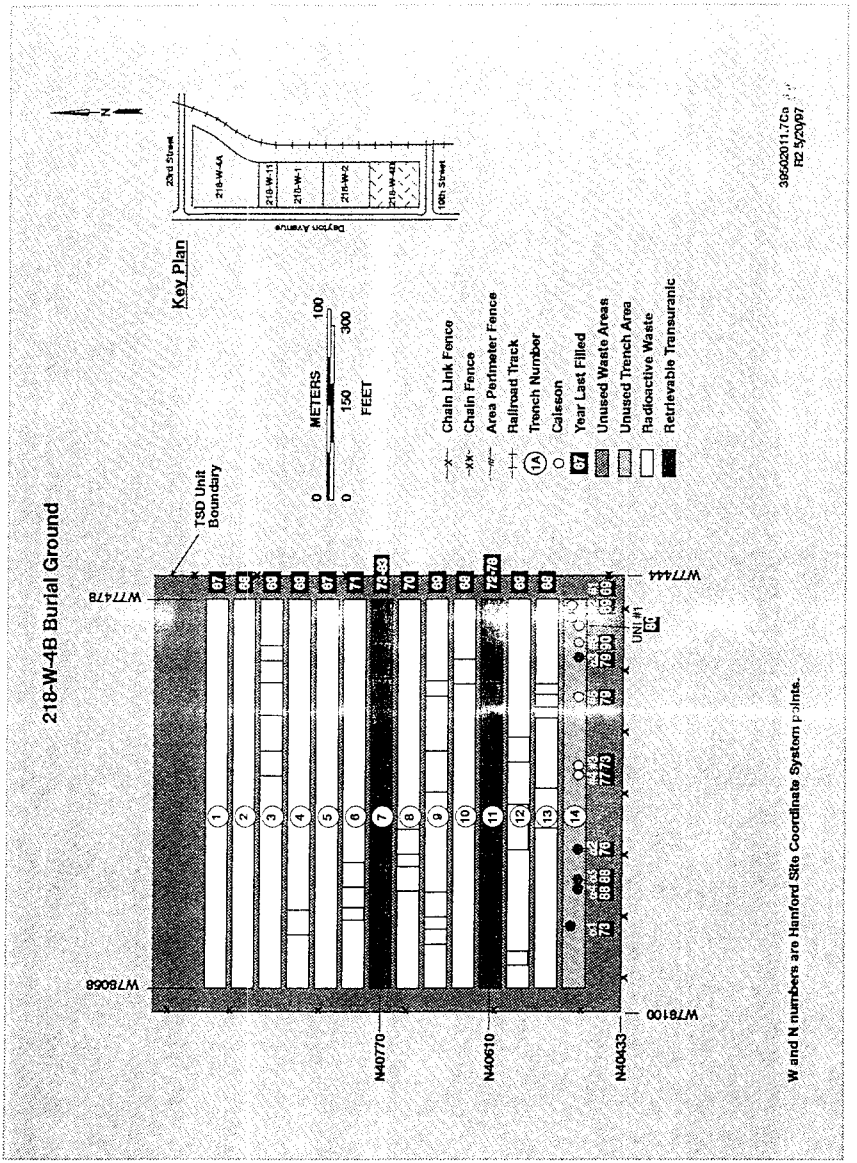


Figure 1-7. 218-W-4B Burial Ground.

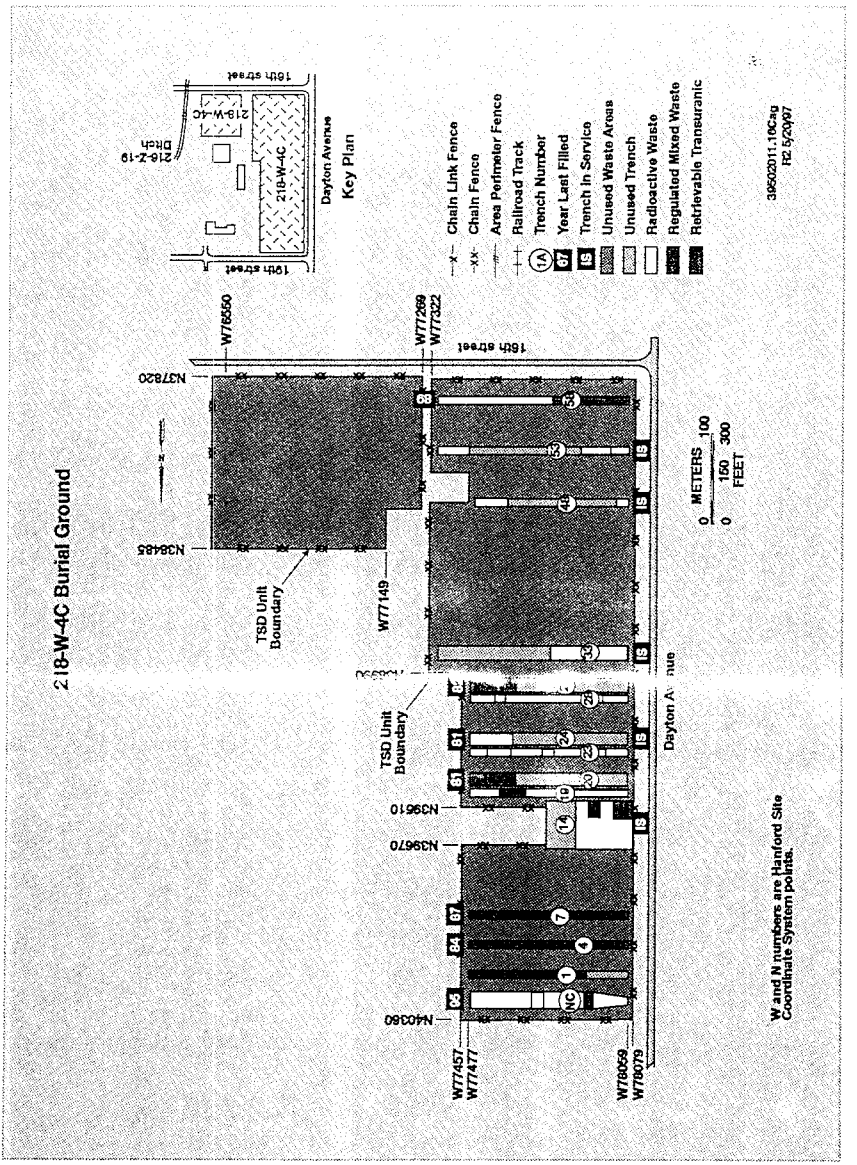


Figure 1-8. 218-W-4C Burial Ground.

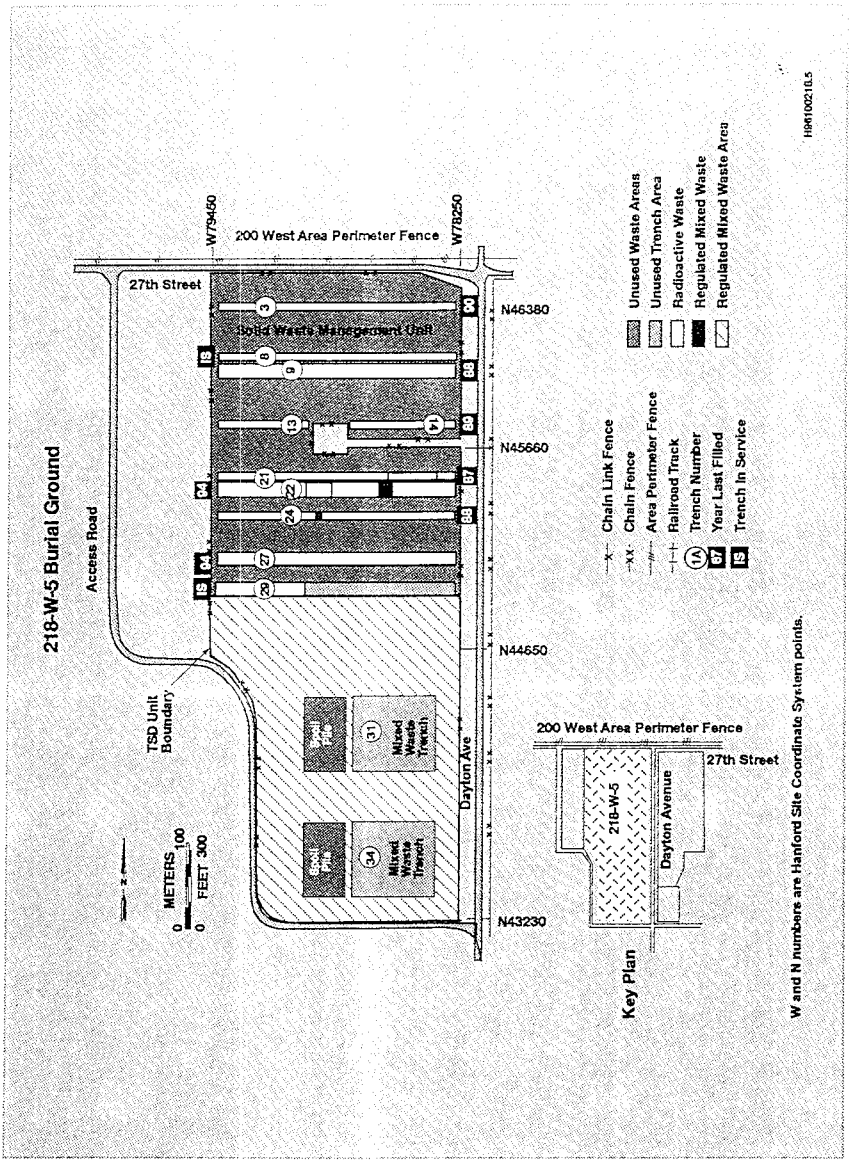


Figure 1-9. 218-W-5 Burial Ground.

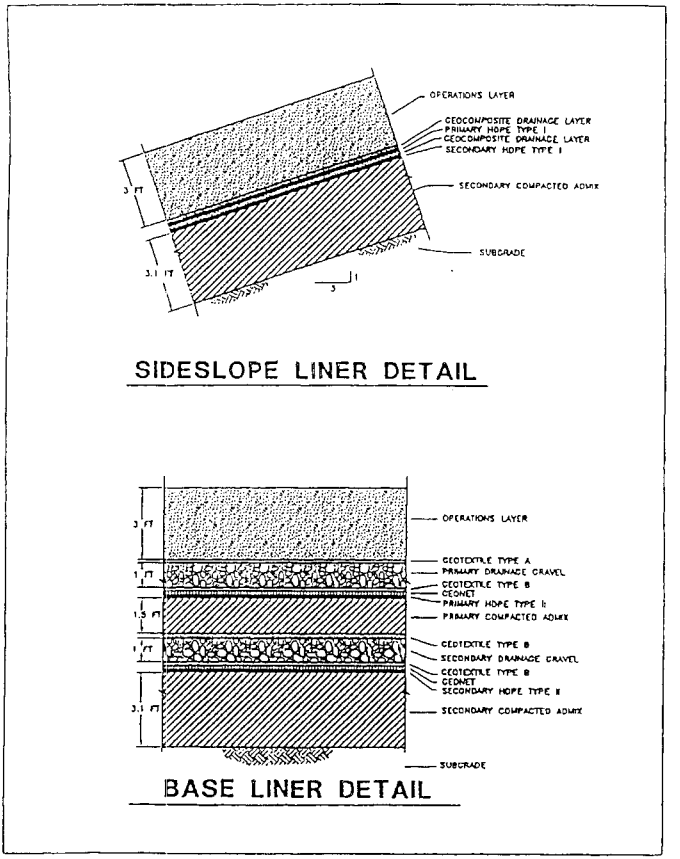


Figure 1-10. Typical Resource Conservation and Recovery Act-Compliant Liner System.

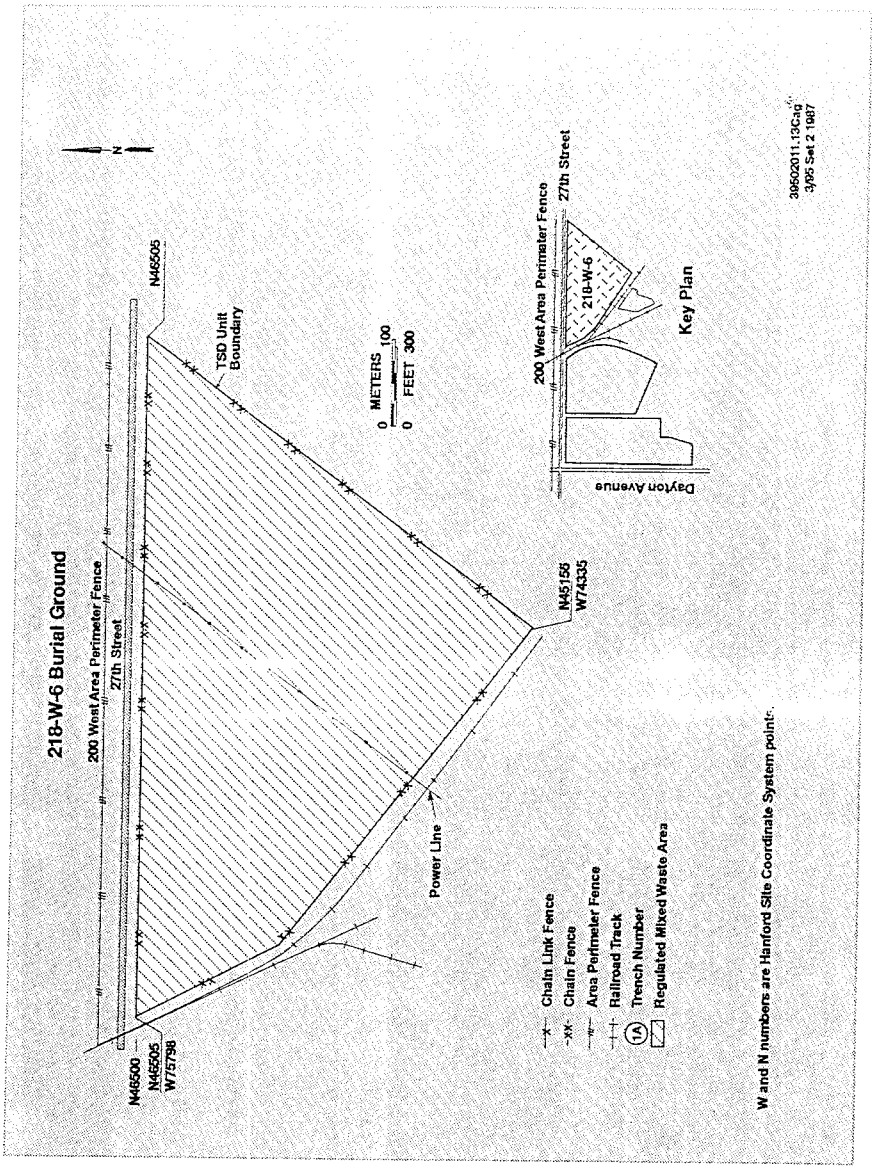


Figure 1-11. 218-W-6 Burial Ground.

Generator : _____

Month _____ Year _____

Generator:	Range	Score -include justification
Designation Conformance Issue(s)		
regulatory violation	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Characterization Conformance Issue(s)		
safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Paperwork Inconsistencies		
LDR form	1-3	
shipping papers or waste tracking forms	1-3	
profile discrepancies	1-3	
incomplete shipment/transfer information	1-3	
Screening Conformance Issue(s)		
regulatory violation and/or a safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
Receipt Conformance Issue(s)		
regulatory violation and/or a safety issue	7-10	
mismanagement of waste	4-6	
no mismanagement of waste	1-3	
		SCORE:

Number of containers received: _____

Number of containers screened (including date of activity): _____

Additional Comments:

_____

_____

_____. Initial Evaluation completed by: _____

Note - a score of 10 or more requires input from the performance evaluation system team.

Figure 1-12. Example Generator Evaluation Worksheet.

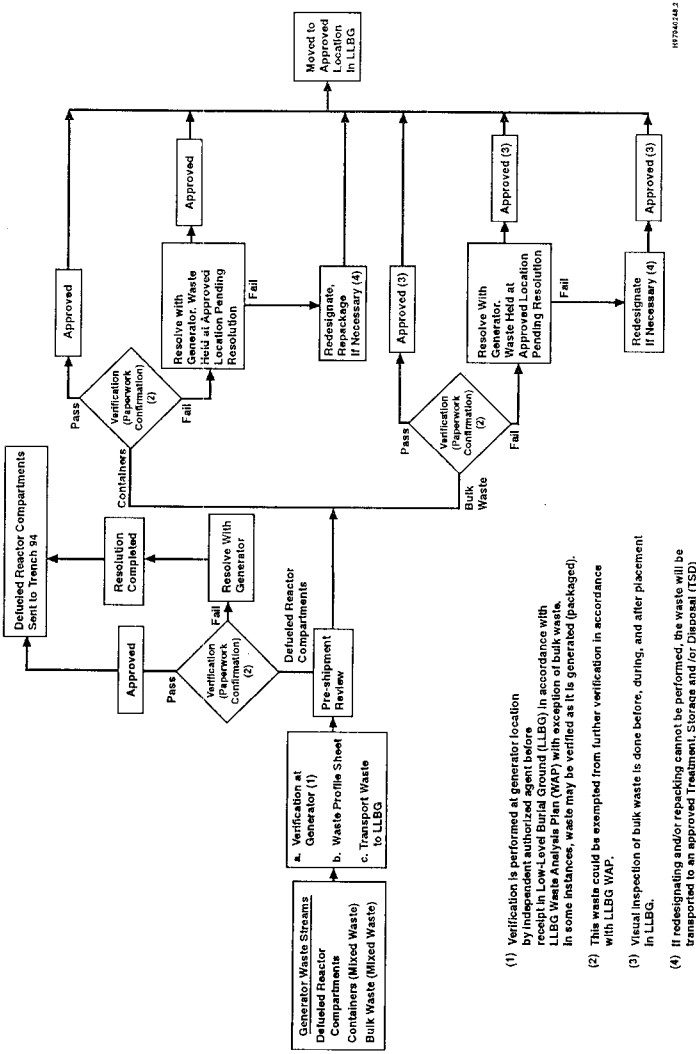


Figure 1-13. Low-Level Burial Grounds Waste Analysis Plan Flowchart.

Table 1-1. Incompatible Chemicals.

Amyl chloride	Diethyl benzene	Nitrobenzene
Aqua regia	Diethyl ether	Perchlorobenzene
Bromic acid	Elemental bromine	Propylene dichloride
Bromobenzene	Elemental chlorine	Sulfur trioxide
Bromoform	Elemental fluorine	Sulfuric acid (fuming)
Calcium bisulfite	Ethyl chloride	Thionyl chloride
Calcium sulfide	Ethylene trichloride	Vinylidene chloride.

2.0 DESCRIPTION OF CONFIRMATION PROCESS

This section covers the confirmation process and includes the appropriate pre-shipment review and/or verification steps and/or parameters. Confirmation process requirements appear twice in WAC 173-303-300 and apply to two different scenarios [refer to process flowchart (Section 1.0, Figure 1-13) for confirmation process].

Scenario 1: The process that an owner or operator uses to confirm knowledge supplied by the generator is acceptable knowledge to ensure that the waste is managed properly. [WAC 173-303-300(1)].

Scenario 2: The process that the LLBG operating organization uses to determine, by analysis if necessary, that each offsite waste received at the LLBG matches the identity of the waste specified on the accompanying manifest or shipping paper. [WAC 173-303-300(3)].

2.1 PRE-SHIPMENT REVIEW

Pre-shipment review takes place before waste can be scheduled for transfer or shipment to the LLBG. The review focuses on whether the waste stream is defined accurately and the LDR status determined correctly. Only waste determined to be acceptable for disposal is scheduled. This determination is based on the information that the generator provides. The following sections discuss the pre-shipment review process.

2.1.1 Pre-Shipment Review Process

The pre-shipment review ensures the waste has been characterized and the data provided qualify as 'acceptable knowledge' (Section 1.1.4.1). The information obtained from the generator during the pre-shipment review, at a minimum, includes all information detailed in Section 1.1.4.2.

Waste could be characterized on a waste stream basis. Individual container data must be compared to the waste profile data to ensure the information is accurate. Every transfer or shipment must be reviewed to ensure the waste meets the acceptance criteria for the LLBG. The repeat and review frequency for generators to review profile information will be yearly or as the waste generation process changes.

For each waste transfer or shipment that is a candidate for disposal, the generator provides (1) all pertinent chemical, radiological, and physical data requested on the waste tracking form/shipping paper; (2) other supporting documentation such as MSDS, analytical data, etc.; (3) a description of the waste contents on the container inventory record; and (4) LDR notification/certification information or equivalent documentation (e.g., national capacity variance, contained-in determination variance, etc.,) as applicable. The pertinent information is entered into a solid waste information tracking system (SWITS).

Based on waste identification information provided, the waste designation is reviewed to ensure consistency with waste designations per WAC 173-303-070, as well as for technical accuracy to ensure the waste meets the waste acceptance criteria. If the transfer or shipment information is found to be acceptable, a final operations review is completed and the transfer or shipment is scheduled. For bulk waste, every truck load is inspected visually; any waste showing visible variations in color, texture, or wetness is subject to sampling per this WAP.

Where potential nonconformances exist in the information provided, waste characteristics do not match the waste certification summary, or additional constituents are expected to be present that do not appear on the documentation, the generator is contacted by the LLBG operating organization or an approved designated organization for resolution.

2.1.2 Methodology to Ensure Compliance with Land Disposal Restrictions Requirements

Only mixed waste that meets the treatment standards of 40 CFR 268 and WAC 173-303-140 is considered for disposal. Because waste treatment to meet LDR criteria does not occur at the LLBG, all generators are subject to LDR or any LDR-related variances and are required to submit all the notifications and certifications described in 40 CFR 268.7. The following are general requirements for notifications and supporting documentation.

- The waste is subject to LDR and the generator has treated the waste.
  - The generator supplies the appropriate LDR certification information (40 CFR 268 and WAC 173-303-140).
- The waste is subject to LDR and the generator has determined that the waste naturally meets the LDR treatment standard for disposal.
  - The generator develops the certification based on process knowledge, analytical data, and supplies the appropriate LDR certification information necessary to demonstrate compliance with the LDR treatment standards of 40 CFR 268 and WAC 173-303-140.
- The waste is subject to an exemption from a prohibition on landfill disposal.
  - The generator submits a notice stating the waste is not prohibited from land disposal as required by 40 CFR 268.7(a)(3) and WAC 173-303-140(6).

A representative sample of the waste could be required to be submitted for analysis to ensure that contamination-based LDR requirements are met. The frequency of corroborative testing for the purpose of confirming compliance with LDR standards (concentration based and underlying hazardous constituents) is (1) a minimum of one test for the case where the variability of the waste constituents of concern(s) is determined and (2) a minimum of three tests for

the case where the variability of the waste constituents of concern(s) is not determined. In both cases, if the test results are less than the standard or underlying hazardous constituent threshold or if above the threshold but not statistically different than the data on which the certification of LDR compliance was made, the waste is corroborated as being compliant with LDR standards.

2.2 WASTE VERIFICATION

Verification consists of container receipt inspection, physical screening, and chemical screening as required by the criteria set forth in this WAP. Waste verification consists of testing key physical and chemical properties. Waste verification parameters are selected based on the following criteria:

- The need to identify restricted waste
- Parameters important to the proper management of waste at the LLBG
- Parameters that can be used to corroborate that waste received matches the identity of waste specified on accompanying transfer or shipping papers
- The need to protect human health and the environment.

Incoming waste verification is accomplished by reviewing applicable documentation and waste tracking forms or shipping papers against the waste. The physical/chemical screening frequencies are applied for verification purposes only. A waste stream is defined as having similar physical and chemical characteristics and dangerous waste numbers and the same LDR treatment requirements and waste management requirements.

For containers disposed in the lined trenches, the following verification rates apply:

- Offsite--the minimum physical verification rate is 10 percent of each waste stream applied per generator, per shipment
- Onsite--for verification purposes only, waste streams generated by each Hanford Site contractor and each of their subcontractors is verified at 5 percent per year.

Verification is performed using a combination of container receipt inspection, physical screening, and/or chemical screening. Verification is performed at an approved location [e.g., Central Waste Complex (CWC), Waste Receiving and Processing 1 (WRAP 1), etc.] as determined by the LLBG operating organization.

A bulk waste stream could be verified by screening the allowable rate of the total number of loads throughout the waste stream*.

2.2.1 Container Receipt Inspection

The container receipt inspection is a mandatory element of the confirmation process. Therefore, 100 percent of the containers/shipments are inspected for damage and to ensure the waste containers shipped are those denoted in the documentation. This activity is a mechanism for identifying containers that have not been subject to a pre-shipment review, identifying any paperwork issues, or identifying damaged containers before receipt of the container.

2.2.2 Physical Screening Process Guidance

Physical screening is considered an additional verification element. This section provides guidance on the methods and frequency concerning the use of physical screening as a verification activity.

Waste received before the establishment of a verification program must be verified when initially transferred to the LLBG. However, waste stored in the CWC, WRAP 1, etc., that has been processed through a physical screening program does not require additional physical screening [e.g., transuranic (TRU) certification program, current waste specification program, and backlog confirmation program, 183-H Solar Evaporation Basins sampling program].

2.2.2.1 Physical Screening Methods. Each of the following physical screening methods identified complies with the requirement to verify a waste and are listed in order of preference. The verifier must document the reasoning behind the method chosen when using a method other than #1 or #2.

1. Visual inspection (opening the container)
2. Nondestructive examination [real-time radiography (RTR)]
3. Nondestructive assay
4. Dose rate profile.

2.2.2.2 Physical Screening Frequency. The minimum physical screening frequency is in accordance with Section 2.2. The LLBG operating organization adjusts the physical screening frequency for generators based on objective performance criteria (refer to Section 1.1.2).

Containers that comprise the verification sample set are chosen using the following bias sampling methodology:

- Choose any and all containers for which concerns were identified during pre-shipment review

---

* Note: A bulk waste stream is defined as large volumes of waste from a single generating event (e.g., soil remediation from a single location).

- Choose containers from separate locations and containing waste from different waste specification records (WSRds) to ensure that the verification program accurately tests for variability within programs and waste types

- If one and two are not applicable, randomly choose containers from the 'General Waste Stream'* as required to meet the applicable physical screening frequency.

If one container out of a verification sample set fails, another sample set or 3 additional containers (whichever is larger) must be chosen for physical screening (i.e., if the initial verification sample set equals three containers and one fails, then three more containers must be chosen). If two containers fail, the entire shipment fails.

If RTR is used to meet the physical screening requirements, 5 percent per year of the containers that have been nondestructively examined must be opened to ensure the equipment is functioning appropriately. Containers opened for other reasons, such as chemical screening or to investigate inconsistencies, could be used to meet this requirement. This requirement is based on the total number of containers reviewed not on a shipment or general waste stream basis. The generator is required, at a minimum, to meet this requirement over a 3 month average with a minimum of one container being opened every month the RTR is used for physical screening.

2.2.2.3 Physical Screening Exceptions. There are cases in which physical screening is not required. Therefore, the following exceptions have been developed to account for these instances.

- Shielded, classified, and remote-handled mixed waste is not required to be physically screened; however, the generator must perform a more rigorous documentation review and obtain the raw data used to characterize the waste. Ecology will be notified and have the opportunity to review information on this waste type before shipment. For classified waste, it is necessary to have an appropriate DOE security clearance and a need-to-know the information as defined by the classifying organization or agency.

- Mixed waste that cannot be physically screened at the LLBG or associated verification facility by acceptable physical screening methods must be physically screened at the generator location (e.g., large components, containers that cannot be opened, greater than 20 millirem per hour at 30 centimeters, contain greater than 10 nanocuries per gram of transuranic radionuclides, or will not fit into the nondestructive examination unit). Physical screening at the generator location consists of observing the packaging of the waste.

---

* Note: 'General Waste Stream' is defined as a waste from a single generator in the same waste management group.

If no location can be found to perform the physical screening, no screening is required.

- Mixed waste that is packaged by an independent authorized agent for the LLBG operating organization is considered to have met the physical screening requirements denoted in this WAP.

- A bulk mixed waste stream could be verified by an applicable screening frequency identified in Section 2.2.

2.2.3 Chemical Screening Process Methods

Chemical screening is considered an additional verification element. This section provides guidance on the methods and frequency concerning the use of chemical screening as a verification activity.

The LLBG operating organization must describe the appropriate parameters for the waste accepted into the LLBG. At a minimum, at least three of the following methods must be used to complete the chemical screening process for mixed waste subject to physical screening. However, if only three methods are used, the generator must document the reasoning used to determine the chemical screening methods chosen (at a minimum, pH will be one of the three methods chosen):

- pH

- HH (Chlor-n-oil/water/soil)

- Ignitability and/or headspace testing (e.g., lower explosive limit, portable gas chromatograph, flame ionization detector, photoionization detector, high-voltage adapter. Instrument must be appropriate for conditions)

- Peroxide

- Oxidizer

- Sulfide

- Cyanide

- Paint Filter

- Water Reactivity.

2.2.3.1 Chemical Screening Frequency. At a minimum, 10 percent of the mixed waste verified by physical screening (Section 2.2.2.2) must be screened chemically. Chemical screening is not required to use SW-846 methodology. Although grab samples are acceptable, the LLBG operating organization must obtain a representative sample.

Laboratory hood waste packaged in accordance with 40 CFR 264.316/ 40 CFR 265.316, and WAC 173-303-161 must be screened chemically. Inner containers are segregated by physical appearance. At least one container from each group (or three containers if all similar) will be screened chemically. Solids require no chemical screening.

2.2.3.2 **Chemical Screening Exceptions**. There are cases in which chemical screening is not required. Therefore, the following exceptions have been developed to account for these instances:

- Waste that is exempted from the physical screening requirements (Section 2.2.2.3) is exempted from chemical screening
- Commercial chemical products (mixed waste) in the original product container(s) (i.e., off-specification, outdated, or unused products)
- Chemical containing equipment (mixed waste) removed from service, (i.e., ballasts, batteries, etc.)
- Hazardous debris (mixed waste) as defined in WAC 173-303-040
- Mixed waste containing asbestos
- Mixed waste, environmental media, and/or debris from the cleanup of spills or release of single substance or commercial product or otherwise known material (i.e., material for which an MSDS can be provided)
- Confirmed noninfectious mixed waste (i.e., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes
- Containers with an external dose rate of >20 millirem per hour at 30 centimeter and/or contain >10 nanocuries per gram of transuranic radionuclides
- Other special-case situations handled on a case-by-case basis.

This page intentionally left blank.

3.0 SELECTING WASTE ANALYSIS PARAMETERS

The following discusses selecting waste analysis parameters, associated rationale, and methods for these analyses. The analytical screening parameters that could be used for waste received at the LLBG are as follows.

- Physical description--used to determine the general characteristics of the waste. This facilitates subjective comparison of the sampled waste with previous waste descriptions or samples. Also, a physical description is used to verify the observational presence or absence of free liquids.

  Methods--samples are inspected and the physical appearance of the waste is recorded. RTR and/or visual examination is used.

- Radioactivity screen--used to quantify radionuclides for verification of transuranic radionuclide content, nontransuranic radionuclide content, and the waste classification (i.e., low-level waste or transuranic).

  Methods--a sample of the waste is passed by a geiger counter, survey meter, or a waste container is assayed using passive-active neutron or segmented gamma scanning techniques.

- Ignitability and/or headspace volatile organic compound analysis--performed to determine the ignitability and the presence or absence of solvents or other volatile organic compounds in waste. The headspace volatile organic compound analysis is one of the few methods available to evaluate the presence of volatile organic compounds that could be associated with heterogeneous materials.

  Methods--for headspace volatile organic compounds, a sample of the headspace gases in a container is analyzed by one or more of the following: Fourier transform infrared spectroscopy, gas chromatography/mass spectroscopy, HNU, organic vapor analyzer, and colorimetric tubes.

- Paint filter liquids test--used to verify the presence or absence of free liquid in solid or semisolid material to be landfilled.

  Method--to a standard paint filter, 100 centimeters or 100 grams of waste are added and allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test (SW-846 Method 9095).

- pH screen--used to identify the pH and corrosive nature of an aqueous or solid waste, to aid in establishing compatibility strategies, and to indicate if the waste is acceptable for disposal in the LLBG.

  Methods--full range pH paper is used for the initial screening. If the initial screen indicates a pH below 4 or above 10, a pH meter is

used. Procedures for preparing and extracting the solution and liquid are described in the test procedures of WAC 173-303-110(3)(a).

- Oxidizer potential screen--used to determine the fire-producing potential of the waste. This test can be applied to waste liquids, solids, and semisolids.

  Methods--all waste forms are tested using oxidizer tests.

- Water reactivity screen--used to determine if the waste has the potential to react vigorously with water to form gases or other reaction products.

  Method--for liquid waste, water is added to the waste. The solution is observed for evidence or fuming, bubbling, or spattering. These reactions are considered to be positive evidence that the waste is water reactive.

- Cyanide screen--used to indicate whether the waste produces hydrogen cyanide upon acidification below pH 2.

  Method--to a test tube or beaker containing approximately 5 milliliters of sample, an equal amount of freshly prepared ferrous ammonium citrate is added. 3 Normal hydrochloric acid is used to reduce the pH of the solution to about 2.0. A deep blue color indicates the presence of cyanide. The test can detect free cyanide and complex cyanides in concentrations above 200 parts per million.

- Sulfide screen--used to indicate if the waste produces hydrogen sulfide upon acidification below pH 2.

  Methods--sample is added to beaker or test tube and enough 3 Normal hydrochloric acid is added to bring the pH down to 2.0. A sulfide test strip is placed in the solution. If the paper turns brown or silvery black, the presence of sulfides in the sample is indicated. If there is no color change, the total sulfides are reported as nondetectable.

- HH screen--used to indicate whether polychlorinated biphenyls (PCBs) are present in oil-bearing waste and to determine if the waste needs to be managed in accordance with the regulations prescribed in the *Toxic Substance Control Act of 1976*.

  Method--the tests to be conducted include the HAZCAT* beilstein test, and/or the appropriate organic chlorine test.

---

* HAZCAT is a registered trademark of Haztech Systems Incorporated, San Francisco, California.

4.0 SELECTING SAMPLING PROCEDURES

Specific sampling processes depend on both the nature of the material and the type of packaging. This section describes the sampling methodology.

4.1 SAMPLING STRATEGIES

Chemical screening is done in accordance with Table 4-1. Refer to Section 2.0 for discussion on sampling limitations, criteria for frequency, numbers and types of samples, and exceptions of waste categories and/or waste streams that cannot be sampled. Chemical screening might be performed in the trench, at the generator, or at another location approved for the waste to be sampled.

4.2 SELECTING SAMPLING EQUIPMENT

Sampling equipment selection is detailed in Table 4-1. Sampling equipment needed to sample waste is maintained and decontaminated by the LLBG operating organization.

4.3 SAMPLE PRESERVATION

Chemical screening methods referenced or described in Section 3.0 do not require any preservation methods.

4.4 ESTABLISHING QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES FOR SAMPLING

The following quality assurance/quality control (QA/QC) elements are used by LLBG operating organization, before transferring or shipping waste to the LLBG, to ensure sampling activities result in acceptable laboratory data:

- Using representative sampling methods as defined by WAC 173-303-110(2), 40 CFR 261 Appendix I, and/or SW-846 Chapter 9, whenever possible
- Using appropriate sample containers and equipment
- Numbering samples properly
- Using a standard labeling procedure
- Using field QA/QC samples
  - 1 in 20 to laboratory
  - 1 duplicate per event
  - 1 in 20 blank.

- Expiration date not expired
- Equipment calibration current.

Table 4-1. Low-Level Burial Ground Chemical Screening Sampling Results.

Waste type	Reference in SW-846 (EPA 1986)	
	Waste type	Equipment
Liquids	Free-flowing liquids and slurries	COLIWASA, SW-846, Chapter 9, glass thief or pipet
Solidified liquids	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Sludges	Sludges	Trier, SW-846, Chapter 9, scoops and shovels
Soils	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
Absorbents	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Wet absorbents	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
Process solids and salts	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels
	Large-grained solids	Large trier, SW-846, Chapter 9, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier, SW-846, Chapter 9, scoops and shovels
	Dry powders or granules	Thief, SW-846, Chapter 9, scoops and shovels
	Sand or packed powders and granules	Auger, SW-846, Chapter 9, scoops and shovels

COLIWASA = composite liquid waste sampler.
NA = not applicable.

5.0 SELECTING A LABORATORY, LABORATORY TESTING, AND ANALYTICAL METHODS

The following sections discuss selecting a laboratory for analyzing samples for QA/QC elements.

5.1 SELECTING A LABORATORY

The following laboratory QA/QC requirements apply to laboratory analyses of generator waste.

- The daily quality of analytical data generated in the contracted analytical laboratories is controlled by the implementation of an analytical laboratory QA plan.

- Before commencement of the contract for analytical work, the laboratory submits their QA plan for approval. At a minimum, the plan documents the following:

  - Sample custody and management practices
  - Sample preparation and analytical procedures
  - Instrument maintenance and calibration procedures
  - Internal QA/QC measures, including the use of method blanks
  - Sample preservatives used
  - Analyses requested.

When required, replicate testing usually is accomplished by analyzing two samples, one by the generator and another by the LLBG operating organization.

5.2 SELECTING TESTING AND ANALYTICAL METHODS

The generator describes and identifies the analytical methods to be used to analyze for the physical and chemical screening parameters identified in Section 3.0 for the mixed waste categories. If more than one testing and/or analytical method is used for a given physical and chemical screening parameter, the LLBG operating organization identifies all methods and applications.

The generator identifies the type of testing and analytical method to be used at the laboratory (e.g., for metals analysis state which type of determination procedure will be used such as inductively coupled plasma metals by atomic absorption).

The generator identifies the decision level necessary for each analytical parameter. If the decision level is found in a regulation, the generator references the regulation. Section 3.0 identifies the applicable decision levels, operational parameter(s), and analytical methods necessary to ensure that the waste is within the LLBG acceptance criteria.

This page intentionally left blank.

6.0 SELECTING WASTE RE-EVALUATION FREQUENCIES

This section is not applicable to the LLBG for waste that is placed in a disposal configuration. Newly generated waste is re-evaluated annually as necessary to ensure the waste stream has not changed.

This page intentionally left blank.

7.0 SPECIAL PROCEDURAL REQUIREMENTS

This section discusses any special process requirements for receiving mixed waste at the LLBG.

7.1 PROCEDURES FOR RECEIVING WASTE GENERATED ONSITE

Mixed waste received from onsite generators is detailed in Sections 2.2 and 3.0 and a flowchart is provided (Figure 1-13).

7.2 PROCEDURES FOR RECEIVING WASTE GENERATED OFFSITE

Mixed waste received from offsite is handled in the same manner as mixed waste received from onsite, with the exception of defueled reactor compartments disposed in trench 94 of the 218-E-12B Burial Ground, which are transported directly from the generator to trench 94.

7.3 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

The LLBG does not accept ignitable, reactive, or incompatible waste (refer to Section 1.2). The following is how the LLBG operating organization ensures that ignitable, reactive, or incompatible waste is not accepted at the LLBG.

- Pre-shipment review and chemical screening ensures ignitable and reactive waste are not accepted.
- Pre-shipment review alone ensures waste incompatible with the liner in the lined trenches are not accepted.

7.4 PROVISIONS FOR COMPLYING WITH FEDERAL AND STATE LAND DISPOSAL RESTRICTION REQUIREMENTS

Sections 1.1.4.1.2 and 2.1.2 describe compliance with federal and state LDR requirements.

1
2
3
4
5

This page intentionally left blank.

8.0 RECORDKEEPING

Recordkeeping requirements that are applicable to this WAP are described in Chapter 12.0, Table 12-1, of the General Information Portion (DOE/RL-91-28).

This page intentionally left blank.

9.0 REFERENCES

DOE/RL-88-20, *Hanford Facility Dangerous Waste Permit Application, Low-Level Burial Grounds*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-91-28, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*, U.S. Department of Energy, Richland Operations Office, Richland, Washington, revised periodically.

EPA, 1986, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Third Edition, as amended, U.S. Environmental Protection Agency, Washington, D.C.

This page intentionally left blank.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	D. A. Pratt, RFSH	Date 05/01/97
Project Title/Work Order		EDT No. NA
Waste Analysis Plan for the Low-Level Burial Grounds		ECN No. 639100

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
S. M. Addleman	T4-04				X
B. M. Barnes	T4-04				X
R. C. Bowman	H6-24				X
P. J. Crane	T4-04				X
R. M. Irwin	T4-03				X
K. M. McDonald	T4-04				X
D. A. Pratt	T4-03				X
J. R. Rosser	T4-03				X
D. G. Saueressig	H6-24				X
R. W. Whitlock	T4-04				X
Central Files	A3-88	X			