ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 644482

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [] Change ECN [X] Temporary [] Standby [] Supersedure [] Cancel/Void []	M. J. Kupfer, LMHC, H5-49, 376-6631	[] Yes [X] No	7/15/98
	6. Project Title/No./Work Order No. Tank 241-SY-103	7. Bldg./Sys./Fac. No. NA	8. Approval Designator NA
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-ER-471, Rev. 1A	10. Related ECN No(s). NA	11. Related PO No. NA

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)	NA	NA Design Authority/Cog. Engineer Signature & Date	NA Design Authority/Cog. Engineer Signature & Date

13a. Description of Change — 13b. Design Baseline Document? [] Yes [X] No

This ECN compiles all reconciliation changes to the Best-Basis Inventory made in FY98. Revisions were made to Appendix E, Evaluation to Establish Best-Basis Inventory for Double-Shell Tank 241-SY-103. Changes were made to both text and tables. The inventory estimates of several waste components were revised. The reconciliation process involved correction of errata, reassessment of data outlyers, verification of uranium isotopic distribution and other alpha isotope distribution, and removal of "less than" values, etc. Replace Appendix E with this ECN.

14a. Justification (mark one)

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

14b. Justification Details

Tank waste inventory estimates are being provided as standard source term for the various waste management activities. FY 1997 evaluation of available information for all 177 underground storage tanks was performed and published in TCRs, preliminary TCRs, or revisions to existing TCRs. In FY 1998, a reconciliation process is being performed to update the best-basis inventories. This process ensures that the latest inventory estimates are available as a consistent source-term to support the activities of TWRS disposal and other users.

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

See distribution sheet.

Central Files	B1-07
DIMC	H6-15
DOE Reading Room	H2-53
TCSRC	R1-10
K. M. Hall	R2-12
K. M. Hodgson	R2-11
M. J. Kupfer	H5-49
M. D. LeClair (3)	H5-49
J. M. Conner	R2-11

RELEASE STAMP

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) 644482

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

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	[]	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	[]	Other	[X]
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

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng.	M. J. Kupfer JW Cammann for	7/30/98	PE		
Cog. Mgr.	K. M. Hodgson K.M. Hodgson	7-28-98	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other	J. M. Conner R2-11 JM Conner	7-17-98	Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

WHC-SD-WM-ER-471, Rev. 1B

Tank Characterization Report for Double-Shell Tank 241-SY-103

S. L. Lambert
COGEMA Engineering Corporation, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 644482 UC: 721, UC-2000 cw
Org Code: 7A110 Charge Code: N4G3A
B&R Code: EW3120074 Total Pages: 191 cw 7-31-98

Key Words: TCR, best-basis inventory, standard inventory

Abstract: The best-basis inventory provides waste inventory estimates that serve as standard characterization source terms for the various waste management activities. To establish a best-basis inventory for double-shell tank 241-SY-103, an evaluation of available information was performed. This work follows the methodology established in *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes*, HNF-SD-WM-TI-740, Rev. 0A (Kupfer et al. 1997).

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DATE: HANFORD RELEASE ID:
STA: 37 22

Christine Willingham 7-31-98
Release Approval Date Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number WHC-SD-WM-ER-471	Page 1

(2) Title
Tank Characterization Report for Double-Shell Tank 241-SY-103

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) Initially released 03/29/96 on EDT-615357.	D.R. Hansen	J.G. Kristofzski
1 RS	Incorporate per ECN-635348.	J.M. Conner	J.G. Kristofzski
		[signature]	[signature] 7/1/96
1A RS	Incorporate per ECN-634633	M.J. Kupfer	K.M. Hodgson
		[signature] 8-15-97	K.M. Hodgson 8-18-97
1B RS	Incorporate per ECN-644482	M.J.Kupfer	K.M. Hodgson
		7/30/98 J Cammann for	K.M. Hodgson 7-28-98

A-7320-005 (08/91) WEF168

APPENDIX E

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-SY-103

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APPENDIX E

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-SY-103

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of available information for double-shell tank 241-SY-103 was performed, and a best-basis inventory was established. This work, detailed in the following sections, follows the methodology that was established by the standard inventory task.

E1.0 CHEMICAL INFORMATION SOURCES

Available waste (chemical) information for tank 241-SY-103 includes:

- The information included in sections 2.0, 3.0, 4.0, and 5.0 of this Tank Characterization Report (TCR) on tank 241-SY-103 history, sampling, analyses, and data evaluation

- Inventory estimates for this tank that were generated from the Hanford Defined Waste (HDW) model (Agnew et al. 1997a).

A list of references used in this evaluation is provided in Section E5.0.

E2.0 COMPARISON OF COMPONENT INVENTORY VALUES

Tank 241-SY-103 is one of three tanks making up the SY Tank Farm in the 200 West Area. Initially, this tank received concentrated wastes from the B Plant cesium and strontium recovery campaigns. Later the tank received double-shell slurry and uranium sludge from the ion-exchange processing. Wastes in this tank are segregated in a crust layer, convecting layer, and a non-convecting layer. Periodic gas release events have been observed in this tank. It is believed that hydrogen and other gases are generated and trapped in the non-convecting layer leading to periodic gas release events.

The HDW model inventory estimates for the wastes in tank 241-SY-103 are listed in Tables E2-1 and E2-2 (Agnew et al. 1997a). Also included in Tables E2-1 and E2-2 are inventory estimates based on 1994 core analysis data. The chemical species are reported without charge designation per the best-basis inventory convention. The analytical estimate for Bi is based on values that were below the detection limit for all segments in the 1994 core. The current estimates for La, Mn and Sr (in Tables E2-1 and E4-1) were derived from the 1986 core (Table C-1 in the TCR) normalized to the amount of aluminum in the 1986 and 1994 cores. Aluminum was used as the tie element because the 1986 values were reported in wt%. The derived values for La, Mn and Sr are consistent with the ratios of these elements to uranium in the 1995 sludge washing studies for tank 241-SY-103 waste (Rapko et al. 1995).

Table E2-1. Hanford Defined Waste Model-Based and Sample-Based Inventory Estimates for Nonradioactive Components in Tank 241-SY-103.

Analyte	HDW inventory estimate[a] (kg)	Analytical-based inventory estimates[b] (kg)	Analyte	HDW inventory estimate[a] (kg)	Analytical-based inventory estimates[b] (kg)
Al	125,000	147,000	Ni	1,040	290
Bi	789	NR	NO_2	320,000	377,000
Ca	3,760	939	NO_3	862,000	504,000
Cl	24,500	31,500	OH	477,000	79,700
Cr	20,900	21,900	Pb	630	NR
F	35,900	3,350	PO_4	24,800	40,500
Fe	17,000	5,810	Si	6,240	107
Hg	5.31	NR	Sr	0	8.6[c]
K	7,310	12,800	SO_4	69,500	17,000
La	14.7	100[c]	CO_3	77,700	94,600
Mn	1,040	1,154[c]	TOC	41,800	37,900
Na	920,000	719,000	U_{TOTAL}	6,490	1,670
NH_3	3,910	NR	Zr	60.6	123
H_2O (Wt%)	32.8	41.8	Density (g/mL)	1.61	1.52

HDW = Hanford Defined Waste
NR = Not reported
[a] Agnew et al. (1997a)
[b] Table 4-3 of this Tank Characterization Report (exceptions are La, Mn, and Sr); Table C-1 from 1986 core sample.
[c] 1986 core sample value normalized to the amount of aluminum in the 1994 core sample. Aluminum was used as the tie element because the 1986 values were reported as wt%.

Table E2-2. Hanford Defined Waste Model-Based and Sample-Based Inventory Estimates for Radioactive Components in Tank 241-SY-103.

Analyte	HDW inventory estimate[a] (Ci)	Analytical-based inventory estimates[b] (Ci)	Analyte	HDW inventory estimate[a] (Ci)	Analytical-based inventory estimates[b] (Ci)
^{3}H	715	3.16	^{154}Eu	1,940	1,620
^{60}Co	120	105	^{155}Eu	755	1,410
^{90}Sr	346,000	79,000	^{238}Pu	4.33	35.4
^{99}Tc	759	766	$^{239/240}Pu$	172	134
^{129}I	1.46	0.258	^{241}Am	177	1,440
^{137}Cs	806,000	1.13 E+06			

HDW = Hanford Defined Waste

[a] Agnew et al. (1997a), decayed to January 1, 1994

[b] Table 4-3 of this Tank Characterization Report. Radionuclides analyses completed during the fourth quarter of 1994.

E3.0 COMPONENT INVENTORY EVALUATION

The following evaluation was conducted to assess various estimates of tank contents.

E3.1 WASTE HISTORY FOR TANK 241-SY-103

The waste transfer history for this tank is documented in Section 2.3.1 of this TCR. Tank 241-SY-103 began receiving waste in 1977 from B Plant cesium and strontium recovery campaigns. In 1980, the complex concentrate liquids were transferred out of the tank leaving a 466 kL (123 kgal) heel. Following this transfer, the tank received 1,590 kL (420 kgal) of double-shell slurry (DSS) from the 242-S Evaporator. In 1985, the tank received 121 kL (32 kgal) of uranium sludge from ion-exchange processing. During 1988 and 1989 the tank received liquid waste from salt well pumping of tank 241-SX-104. From 1981 through 1989 the tank received small quantities of waste water. No waste has been transferred out of this tank since January 1981 and no waste added since 1990. A more detailed transfer history for this tank is available from Agnew et al. (1997b).

E3.2 EXPECTED TYPE OF WASTE BASED ON THIS ASSESSMENT

Agnew et al. (1997a) lists the waste volume as 2,816 kL (744 kgal). Hanlon (1997) lists the waste volume as 2,813 kL (743 kgal). The volume of waste in this tank increases with the gas accumulation and decreases when the gas is vented. As shown in Figure 2-5 of this TCR, the surface level of this tank varies between 688 and 698 cm (271 and 275 in.) as a function of time because of the gas accumulation phenomenon.

Agnew et al. (1997a) identifies the waste as being 2,184 kL (577 kgal) of SMMS2 solids and 632 kL (167 kgal) of liquids. Hanlon (1997) identifies the waste as being 1,370 kL (362 kgal) of sludge, 15 kL (4 kgal) of salt cake, and 1,427 kL (377 kgal) of supernatant liquids. An internal memo (Stauffer 1997) confirms that the solids value of 1,370 kL (362 kgal) listed in Hanlon (1997) is accurate.

This TCR used the 1994 core sampling data to estimate the volume of the convecting layer to be 1,450 kL (384 kgal) (see section 4.2) and the non-convecting layer as 1,370 kL (362 kgal). The crust layer (salt cake) is included in the convecting layer and is assumed to be approximately 15 kL (4 kgal).

Based on process history, tank 241-SY-103 would be expected to contain large quantities of organic complexing agents from the complex concentrate heel left in the tank in 1980. The tank would also be expected to contain large quantities of aluminum, sodium, hydroxide, nitrite, and nitrate from the DSS.

E3.3 BASIS FOR CALCULATIONS USED IN THIS ENGINEERING EVALUATION

The general approach in this engineering assessment is to utilize all available information to formulate the best-basis estimate of the tank's contents. The sources of information may include analytical data from samples taken from the tank of interest, analytical data from other tanks believed to contain waste types similar to those believed to be in the tank of interest, and data from models utilizing historical process records. The confidence level assigned to the best-basis inventory values then depends on the level of agreement among the various information sources.

Since the mid-1980's the surface level in tank 241-SY-103 (and also in tank 241-SY-101) was observed to periodically rise and fall. This behavior was attributed to the accumulation of hydrogen and other gases in the non-convecting layer in the tank. When it was realized that a potentially significant safety issue was associated with the levels of reactive gases being periodically vented from tanks 241-SY-101 and 241-SY-103, a focused characterization effort was initiated. (Details of the safety issue are discussed elsewhere in this TCR.) The waste characterization efforts for tank 241-SY-103 are detailed in Sections 4 and 5 of this TCR.

During August and September of 1994, one push-mode core was obtained from riser 14A of tank 241-SY-103. Details of the sampling event, analysis, analytical results and interpretation are found in sections 3.0, 4.0, and 5.0 of this TCR. The core consisted of 15 segments. The liquid-solid interface was found in segment 9, indicating that about half of the tank contents are supernatant. The analytical results for the composite of drainable liquids from segment 2 through 8, solids composite from segments 2 through 8, and the solids composite from segments 10 through 14 are reported in Tables 4-1 through 4-3 in Section 4 of this TCR. The inventory estimates were developed for the convecting layer and the non-convecting layer and are reported in Table 4-3 of this TCR. The overall tank inventory estimates are also reported in Table 4-3. These data tables are not reproduced in this appendix. However, the sample-based tank inventory estimates are listed in Tables E2-1 and E2-2. Components that were not analyzed for the 1994 core sample were estimated from the 1986 sample (Appendix C) and are also reflected in tables E2-1 and E2-2.

The sample-based inventory estimates from Table 4-3 of this TCR are accepted as the most reliable information available for developing the best-basis inventory estimates. There is little to be gained by attempting to reassess the pre-1980 process records, scattered analytical results, and tank transfer records in hopes of developing an engineering-based estimate that would have higher reliability.

E4.0 DEFINE THE BEST-BASIS AND ESTABLISH COMPONENT INVENTORIES

Information about chemical, radiological, and/or physical properties is used to perform safety analyses, engineering evaluations, and risk assessments associated with waste management activities, as well as regulatory issues. These activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processes, and facilities for retrieving wastes and processing them into a form that is suitable for long-term storage or disposal.

Chemical and radiological inventory information are generally derived using three approaches: (1) component inventories are estimated using results of sample analyses, (2) component inventories are estimated using the HDW model based on process knowledge and historical information, or (3) a tank-specific process estimate is made based on process flowsheets, reactor fuel data, essential material usage, and other operating data. The information derived from these different approaches is often inconsistent.

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of available information for double-shell tank (DST) 241-SY-103 was performed. An assessment of available chemical information for tank 241-SY-103 was performed, including the following:

- The information included in sections 2.0, 3.0, 4.0, 5.0, and Appendix C of this TCR on DST 241-SY-103 history, sampling, analyses, and data evaluation

- Inventory estimates for this tank that were generated from the HDW model (Agnew et al. 1997a).

Based on this engineering assessment, a best-basis inventory was developed for tank 241-SY-103 using concentration data developed in this TCR, when available, or the HDW model tank inventory estimates reported by Agnew et al. (1997a).

Best-basis tank inventory values were derived for 46 key radionuclides (as defined in Section 3.1 of Kupfer et al. 1997), all decayed to a common report date of January 1, 1994. Often, waste sample analyses were only reported for total beta, total alpha, ^{90}Sr, ^{137}Cs, $^{239/240}$Pu, and total uranium, while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129} I, ^{154}Eu, ^{155}Eu and ^{241}Am, etc., were infrequently reported. For this reason it has been necessary to derive many of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track their movement with tank waste transactions. (These computer models are described in Kupfer et al. 1997, Section 6.1 and in Watrous and Wootan 1997.) For ^{233}U, ^{234}U, ^{235}U, ^{236}U, radionuclide inventories were estimated from the total uranium sample estimate with specific corrections for each isotope based on the HDW isotopic ratios. The HDW isotopic ratios were also used to derive estimates for ^{239}Pu and ^{240}Pu.

Model generated values for radionuclides in any of 177 tanks are reported in the Hanford Defined Waste Rev. 4 model results (Agnew et al. 1997a). The best-basis value for any one analyte may be either a model result or a sample or engineering assessment-based result if available. For a discussion of typical error between model derived values and sample derived values, see Kupfer et al. 1997, Section 6.1.10.

The inventory values reported in Tables E4-1 and E4-2 are subject to change. Refer to the Tank Characterization Database (TCD) for the most current inventory values.

Once the best-basis inventories were determined, the hydroxide inventory was calculated by performing a charge balance with valences of other analytes. This charge balance approach is consistent with that used by Agnew et al. (1997a).

Table E4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-SY-103 (Effective May 31, 1997). (2 Sheets)

Analyte	Total inventory (kg)	Basis (S, M, E, or C)[1]	Comment
Al	147,000	S	
Bi	0	S	Below detection limit for all segments of core 62.
Ca	939	S	
Cl	31,500	S	
TIC as CO_3	94,600	S	
Cr	21,900	S	
F	3,350	S	
Fe	5,810	S	
Hg	0	E	Majority of Hg in cladding waste
K	12,800	S	
La	100	S	TCR Table C-1 ratioed to Al
Mn	1,154	S	TCR Table C-1 ratioed to Al
Na	719,000	S	
Ni	290	S	
NO_2	377,000	S	
NO_3	504,000	S	
OH_{TOTAL}	451,000	C	
Pb	630	M	
PO_4	40,500	S	IC analysis
Si	107	S	
SO_4	17,000	S	IC Analysis
Sr	8.6	S	TCR Table C-1 ratioed to Al
TOC	37,900	S	

Table E4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-SY-103 (Effective May 31, 1997). (2 Sheets)

Analyte	Total inventory (kg)	Basis (S, M, E, or C)[1]	Comment
U_{TOTAL}	1,670	S	
Zr	123	S	

[1]S = Sample-based
M = Hanford Defined Waste model-based, Agnew et al. (1997a)
E = Engineering assessment-based
C = Calculated by charge balance; includes oxides as "hydroxide" not including CO_3, NO_2, NO_3, PO_4, SO_4, and SiO_3.

Table E4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-SY-103, Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{3}H	3.16	S	
^{14}C	105	M	
^{59}Ni	6.51	M	
^{60}Co	105	S	
^{63}Ni	639	M	
^{79}Se	10.5	M	
^{90}Sr	79,000	S	
^{90}Y	79,000	S/E	Referenced to ^{90}Sr
^{93}Zr	51.5	M	
^{93m}Nb	37.3	M	
^{99}Tc	759	S	
^{106}Ru	0.0216	M	
^{113m}Cd	273	M	
^{125}Sb	523	M	
^{126}Sn	15.8	M	
^{129}I	0.258	S	
^{134}Cs	9	M	
^{137}Cs	1.13 E+06	S	
^{137m}Ba	1.07 E+06	S/E	Referenced to ^{137}Cs
^{151}Sm	36,900	M	
^{152}Eu	12.7	M	
^{154}Eu	1,620	S	
^{155}Eu	1,410	S	
^{226}Ra	4.36 E-04	M	
^{227}Ac	0.00275	M	
^{228}Ra	0.556	M	
^{229}Th	0.013	M	
^{231}Pa	0.0128	M	
^{232}Th	0.0458	M	
^{232}U	0.619	M/S	Based on U (total); Used HDW isotopic ratios

Table E4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-SY-103, Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{233}U	2.37	M/S	Based on U (total); Used HDW isotopic ratios
^{234}U	0.615	M/S	Based on U (total); Used HDW isotopic ratios
^{235}U	0.0248	M/S	Based on U (total); Used HDW isotopic ratios
^{236}U	0.0193	M/S	Based on U (total); Used HDW isotopic ratios
^{237}Np	2.74	M	
^{238}Pu	35.4	S	
^{238}U	0.557	S	Total U = 1,670 kg. Based on U (total); Used HDW isotopic ratios
^{239}Pu	114	M/S	Based on $^{239/240}Pu$: Used HDW isotopic ratios
^{240}Pu	19.5	M/S	Based on $^{239/240}Pu$: Used HDW isotopic ratios
^{241}Am	1,440	S	
^{241}Pu	229	S/M	Based on ^{239}Pu: Used HDW isotopic ratios
^{242}Cm	3.83	S/M	Based on ^{241}Am: Used HDW isotopic ratios
^{242}Pu	1.26E-03	S/M	Based on ^{239}Pu: Used HDW isotopic ratios
^{243}Am	0.0514	S/M	Based on ^{241}Am: Used HDW isotopic ratios

Table E4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-SY-103, Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]	Comment
^{243}Cm	0.355	S/M	Based on ^{241}Am: Used HDW isotopic ratios
^{244}Cm	3.35	S/M	Based on ^{241}Am: Used HDW isotopic ratios

[1]S = Sample-based
M = Hanford Defined Waste model-based, Agnew et al. (1997a)
E = Engineering assessment-based.

E5.0 APPENDIX E REFERENCES

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