1997 Annual Report on Waste Generation and Waste Minimization Progress as Required by DOE Order 5400.1, Hanford Site

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Standard Data Report

1997 Annual Report on Waste
Generation and Waste Minimization
Progress
as Required by DOE Order 5400.1

Hanford Site
State: WA
Operations Office: RL

Prepared for:
U. S. Department of Energy, Richland Operations Office

Prepared by:
Waste Management Federal Services of Hanford, Inc.

Report Date: 03/10/98

Hanford Site

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CSOs:

Lead CSO - EM
Additional CSOs -

General Site Mission

Hanford's missions are to safely clean up and manage the site's legacy wastes, and to develop and deploy science and technology. Through these missions Hanford will contribute to economic diversification of the region.

Hanford's environmental management or cleanup mission is to protect the health and safety of the public, workers, and the environment; control hazardous materials; and utilize the assets (people, infra-structure, site) for other missions. Hanford's science and technology mission is to develop and deploy science and technology in the service of the nation including stewardship of the Hanford Site. Pollution Prevention is a key to the success of these missions by reducing the amount of waste to be managed and identifying/implementing cost effective waste reduction projects.

Hanford's original mission, the production of nuclear materials for the nation's defense programs, lasted more than 40 years, and like most manufacturing operations, Hanford's operations generated large quantities of waste and pollution. However, the by-products from Hanford operations pose unique problems like radiation hazards, vast volumes of contaminated water and soil, and many contaminated structures including reactors, chemical plants and evaporation ponds.

The cleanup activity is an immense and challenging undertaking, which includes characterization and decommissioning of 149 single shell storage tanks, treating 28 double shell tanks, safely disposing of over 2,100 metric tons of spent nuclear fuel stored on site, removing numerous structures, and dealing with significant solid waste, ground water, and land restoration issues.

Site Generation Data

Routine * vs. Cleanup/Stabilization ** Waste

Waste Type		Routine	Cleanup/Stabilization	Total
High Level Waste	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	0.00 m3	0.00 m3
Transuranic Waste (TRU)	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	13.98 m3	13.98 m3
Mixed-TRU	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	4.16 m3	4.16 m3
Low-Level Waste (LLW)	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	726.69 m3	262432.61 m3	263159.30 m3
Mixed-LLW	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	232.78 m3	274.15 m3	506.93 m3
RCRA Regulated		8.95 mt	205.91 mt	214.86 mt
State Regulated		2.76 mt	5.34 mt	8.10 mt
TSCA Regulated		0.00 mt	41.54 mt	41.54 mt
Mixed-TSCA		0.00 mt	1.88 mt	1.88 mt
Sanitary		1153.22 mt	1218.34 mt	2371.56 mt

Total waste generated at the site during calendar year 1997, which is a sum of all wastes generated regardless of source or activity

* Routine waste is defined as waste produced from any type of production operation, analytical and/or R&D laboratory operations; T/S/D operations, "work for others", or any other periodic and recurring work that is considered on-going in nature.

** Cleanup/Stabilization waste is defined as one-time operations waste: Wastes produced from environmental restoration program activities, including primary and secondary wastes associated with retrieval and remediation operations; "legacy wastes"; and D&D/Transition operations.

Site-Wide Recycling Activities

Paper Products		
Office and Mixed Paper	411.10	mt
Corrugated cardboard	31.83	mt
Phone books	2.60	mt
Newspapers/Magazines	0.00	mt
Aluminum cans	0.00	mt
Glass	0.00	mt
Plastic	0.00	mt
Styrofoam	0.00	mt
Scrap metals		
Stainless steel	0.00	mt
Copper	0.00	mt
Iron	3823.83	mt
Aluminum	0.00	mt
Lead	11.64	mt
Zinc	0.00	mt
Other: (see discussion below)	154.70	mt
Precious metals		
Silver	0.00	mt
Gold	0.00	mt
Platinum	0.00	mt
Other: (see discussion below)	0.00	mt
Toner cartridges	13.77	mt
Batteries	37.86	mt
Engine oils	54.46	mt
Tires	28.07	mt
Food waste	0.00	mt
Concrete	117.93	mt
Wood (chips, compost)	346.29	mt
Other: (see discussion below)	552.11	mt

Percentage of Sanitary Waste Recycled:
 (quantity recycled) / (waste disposed + waste recycled) = 70.20 %

Note: The scrap metal "other" is non-ferrous metals and consists of stainless steel, copper, brass, aluminum and zinc.

Note: Additional solid sanitary waste recycling activities noted under other are discussed in the 1997 Calendar Year End Report Accomplishments Tables. These solid waste recycling activities include items such as asphalt (192.30 mt), cement (87.40 mt), software (32.59 mt), granulated activated carbon (8.39 mt), fluorescent tubes (13.79 mt), moving boxes (5.11 mt), a tent (18.40 mt), and appliances and furniture (77.87 mt).

CSO Specific Information

CSO: EM Waste Generation.

Waste Type		Routine	Cleanup	Total
			Stabilization	
High Level Waste	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	0.00 m3	0.00 m3
Transuranic Waste	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	13.98 m3	13.98 m3
Mixed Transuranic	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	0.00 m3	4.16 m3	4.16 m3
Low Level Waste	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	726.69 m3	262432.61 m3	263159.30 m3
Mixed-LLW	(L)	0.00 m3	0.00 m3	0.00 m3
	(S)	232.78 m3	274.15 m3	506.93 m3
RCRA Regulated		8.95 mt	205.91 mt	214.86 mt
State Regulated		2.76 mt	5.34 mt	8.10 mt
TSCA Regulated		0.00 mt	41.54 mt	41.54 mt
Mixed TSCA		0.00 mt	1.88 mt	1.88 mt

Explanation for changes in reported waste generation amounts for 1996 vs. 1997

Waste type: Routine - Transuranic Waste

CSO: EM

Reported in 1996: 1.80 m3

Reported in 1997: 0.00 m3

Explanation for the significant waste generation change:

There were no routine operations generating TRU waste in 1997. In 1996, one activity, the relining of a process sewer, generated the routine TRU waste.

Waste type: Cleanup/Stabilization - Transuranic Waste

CSO: EM

Reported in 1996: 79.80 m3

Reported in 1997: 13.98 m3

Explanation for the significant waste generation change:

In 1997, the decrease in cleanup/stabilization TRU waste generation quantities reflect the completion of PUREX deactivation activities and a reduction in PFP and K-Basins activities that generate TRU waste.

Waste type: Cleanup/Stabilization - Mixed Transuranic Waste

CSO: EM

Reported in 1996: 7.30 m3

Reported in 1997: 4.16 m3

Explanation for the significant waste generation change:

In 1997, the decrease in cleanup/stabilization MTRU waste generation quantities reflect the completion of PUREX deactivation activities and a reduction in PFP activities that generate MTRU waste.

Waste type: Routine - Low-Level Waste

CSO: EM

Reported in 1996: 1182.40 m3

Reported in 1997: 726.69 m3

Explanation for the significant waste generation change:

The LLW waste stream was reduced due to on-going waste reduction activities (see Calendar Year Accomplishments) and compaction.

Waste type: Cleanup/Stabilization - Low-Level Waste

CSO: EM

Reported in 1996: 31628.60 m3

Reported in 1997: 262432.61 m3

Explanation for the significant waste generation change:

In 1997, the increase in the cleanup/stabilization LLW waste stream can be attributed to environmental restoration activities related to contaminated soil removal and disposal.

Waste type: Routine - Mixed Low-Level Waste

CSO: EM

Reported in 1996: 311.90 m3
Reported in 1997: 232.78 m3

Explanation for the significant waste generation change:

The MLLW waste stream was reduced due to on-going waste reduction activities (see Calendar Year Accomplishments).

Waste type: Cleanup/Stabilization - Mixed Low-Level Waste

CSO: EM

Reported in 1996: 175.70 m3
Reported in 1997: 274.15 m3

Explanation for the significant waste generation change:

The increase in cleanup/stabilization MLLW generation reflects increases resulting from one-time tunnel cleanout activities at the 222S Laboratory and secondary wastes generated during the treatment of legacy waste.

Waste type: Routine - RCRA Waste

CSO: EM

Reported in 1996: 22.50 mt
Reported in 1997: 8.95 mt

Explanation for the significant waste generation change:

The RCRA waste stream was reduced due to on-going waste reduction activities (see Calendar Year Accomplishments).

Waste type: Cleanup/Stabilization - RCRA Waste

CSO: EM

Reported in 1996: 561.30 mt
Reported in 1997: 205.91 mt

Explanation for the significant waste generation change:

In 1997, the decrease in the cleanup/stabilization RCRA waste stream generation quantities reflect a reduction in deactivation, demolition, and decommissioning activities that generated RCRA waste.

Waste type: Routine - State Regulated Waste

CSO: EM

Reported in 1996: 10.00 mt
Reported in 1997: 2.76 mt

Explanation for the significant waste generation change:

The State waste stream was reduced due to on-going waste reduction activities (see Calendar Year Accomplishments).

Waste type: Cleanup/Stabilization - State Regulated Waste

CSO: EM

Reported in 1996: 92.70 mt
Reported in 1997: 5.34 mt

Explanation for the significant waste generation change:

In 1997, the cleanup/stabilization State waste stream generation quantities reflect a reduction in the disposal of PCB transformer oils (< 50 ppm) and other deactivation and decommissioning activities generating State waste.

Waste type: Cleanup/Stabilization - TSCA Waste**CSO: EM****Reported in 1996: 89.30 mt****Reported in 1997: 41.54 mt****Explanation for the significant waste generation change:**

In 1997, the decrease in the cleanup/stabilization TSCA waste stream generation quantities reflect a reduction in the activities of the Electric Utility organization that generate TSCA waste.

Waste type: Cleanup/Stabilization - Mixed TSCA Waste**CSO: EM****Reported in 1996: 5.54 m3 (0.91 mt)****Reported in 1997: 1.88 mt****Explanation for the significant waste generation change:**

MTSCA generation quantities in CYs 1995 and 1996 were represented in m3. The CY 1995 and 1996 MTSCA generation quantities in mt are 2.40 and 0.91 respectively. In 1997, the increase in the cleanup stabilization waste stream generation reflects an increase in activities at PFP that generate MTSCA waste.

Waste type: Cleanup/Stabilization - Sanitary Waste**Reported in 1996: 2537.10 mt****Reported in 1997: 1218.34 mt****Explanation for the significant waste generation change:**

The sanitary waste stream was reduced due to on-going waste reduction activities (see Calendar Year Accomplishments).

Appendix (optional)

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$)-Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	1143 N Paint Shop excess paint disposition. Bechtel Hanford, Inc. sent 110 gallons of paint stripper and 95 gallons of paint to other on-site contractors. These materials were no longer needed and slated for disposal.	1.12 Metric Tons	HAZ	7,440
Recycle/Reuse	183 N Water Treatment Plant maximization of disinfectant materials. Fifteen gallons of sodium hypochlorite were used for pre-treatment disinfection of potable water system and igloo cleaning. The chemical shelf life date had expired. The product was used as a pre-disinfectant prior to using the primary disinfectant.	0.05 Metric Tons	HAZ	1,600
Recycle/Reuse	19 small cylinders of compressed gases were excessed.	0.05 Metric Tons	HAZ	200
Recycle/Reuse	A mercury manometer at the 100 N Basin was sent for reuse.	<0.01 Metric Tons	HAZ	320
Recycle/Reuse	Aerosol cans are sent to the Centralized Consolidation and Recycling Center for re-deployment or volume reduction.	0.71 Metric Tons	HAZ	49,370
Recycle/Reuse	Antifreeze is reclaimed for reuse onsite.	4.55 Metric Tons	HAZ	18,250
Recycle/Reuse	B Plant and Waste Encapsulation/Storage Facility recycled various hazardous liquid waste which was generated as the facilities. Examples included sulfuric acid to a local battery company, waste oil for energy recovery and Aqueous film forming agent fire foam to local fire departments for training uses.	2.80 Metric Tons	HAZ	10,500
Recycle/Reuse	Calibration gases were excessed.	0.06 Metric Tons	HAZ	280
Recycle/Reuse	Excess mercury was sent to the 222S laboratory for reclamation for reuse.	<0.01 Metric Tons	HAZ	20
Recycle/Reuse	Excess paint was sent to an off-site recycler.	0.60 Metric Tons	HAZ	4,000
Recycle/Reuse	Fire extinguishers were excessed.	0.65 Metric Tons	HAZ	2,600
Recycle/Reuse	Five utility poles were sold for reuse.	2.00 Metric Tons	HAZ	500
Recycle/Reuse	Freon was recycled for reuse onsite.	0.01 Metric Tons	HAZ	100
Recycle/Reuse	Fuel mixtures were utilized rather than being disposed.	0.53 Metric Tons	HAZ	2,550
Recycle/Reuse	Incandescent bulbs were sent to an offsite vendor for recycling.	0.07 Metric Tons	HAZ	320
Recycle/Reuse	Laboratory standard was redeployed to Waste Encapsulation and Storage Facility lab.	<0.01 Metric Tons	HAZ	100
Recycle/Reuse	Lead acid batteries were shipped to an offsite vendor for recycling.	22.90 Metric Tons	HAZ	7,560
Recycle/Reuse	Lead was sent to an offsite recycler.	11.64 Metric Tons	HAZ	18,400

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Lead-acid batteries are transmitted to a vendor for recycling through a closed-loop contract.	14.96 Metric Tons	HAZ	4,940
Recycle/Reuse	Machine coolant from 272W fabrication shop was recycled onsite.	13.55 Metric Tons	HAZ	67,795
Recycle/Reuse	Mercury Vapor bulbs were sent to a vendor for offsite recycling.	0.06 Metric Tons	HAZ	100
Recycle/Reuse	New adhesives were transferred to another contractor on site for use.	0.01 Metric Tons	HAZ	760
Recycle/Reuse	Off-specification fuel was returned to a local supplier for re-refining.	6.17 Metric Tons	HAZ	49,400
Recycle/Reuse	One acetylene bottle was returned to the vendor.	0.01 Metric Tons	HAZ	800
Recycle/Reuse	Photographic film and paper were sent to an offsite recycler for silver recovery.	0.01 Metric Tons	HAZ	60
Recycle/Reuse	Photographic fixer was shipped to an offsite recycler for silver recovery.	0.37 Metric Tons	HAZ	1,500
Recycle/Reuse	Shop towels are collected and laundered by a vendor under a closed-loop contract.	2.49 Metric Tons	HAZ	19,930
Recycle/Reuse	Small batteries are transferred to a vendor for recycling offsite.	0.39 Metric Tons	HAZ	1,580
Recycle/Reuse	Sodium vapor bulbs were shipped to an offsite vendor for recycling.	0.31 Metric Tons	HAZ	500
Recycle/Reuse	Spent solvent from fabrication processes was distilled for reuse.	0.04 Metric Tons	HAZ	190
Recycle/Reuse	The CFC-12 refrigerant was removed from 4 of the 8 chillers at the site and sold back to the vendor for 10.00 a pound. The chillers contained approximately 15000 lbs. The CFC-12 was replaced with a CFC-free refrigerant , HFC-134a. This project was supplemented by ROI funding.	6.80 Metric Tons	HAZ	34,800
Recycle/Reuse	Unneeded Dearcide biocide from 328 Building was transferred to 306E for use, thus eliminating the need for disposal.	0.06 Metric Tons	HAZ	270
Recycle/Reuse	Unneeded Kerosene was blended with diesel for use by another organization.	0.15 Metric Tons	HAZ	75
Recycle/Reuse	Unused product, scale clean, was returned to the manufacturer, Grace Dearborn.	0.01 Metric Tons	HAZ	10
Recycle/Reuse	2706T decontamination of various types of equipment including trucks, cranes, and gas cylinders for further use to prevent disposal costs.	0.85 Cubic Meters	LLW	78,200

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Deactivation personnel excessed 15 fission chambers. The chambers were turned over to Pacific Northwest National Laboratory for their use, saving costs for procurement and disposal as low level waste.	0.50 Cubic Meters	LLW	1,000
Recycle/Reuse	Rad signs and deconned rollup door.	37.60 Cubic Meters	LLW	23,660
Recycle/Reuse	Radioactively contaminated materials were removed from the 105 N Building, decontaminated, and released for excess and reuse.	22.50 Cubic Meters	LLW	42,750
Recycle/Reuse	Rail equipment was decontaminated to free release standards by an offsite vendor and sold for recycling of metals.	23.49 Cubic Meters	LLW	44,700
Recycle/Reuse	The 100 N Area Whelan alarm system was deactivated and transferred for reuse at other locations on site.	0.34 Cubic Meters	LLW	20,000
Recycle/Reuse	Decontaminate auger drill strings for reuse.	10.90 Cubic Meters	MLLW	93,636
Recycle/Reuse	Decontamination of augers in the T-Plant canyon has reduced disposal costs and permits reuse of this equipment.	12.26 Cubic Meters	MLLW	169,174
Recycle/Reuse	60 gallons of decontamination chemicals were removed from N Area facilities and re-used within the project.	0.22 Metric Tons	SAN	800
Recycle/Reuse	A 33-foot wide, 68-foot long tent was moved from the 100-D Area to the Liquid Effluent Retention Facility to cover the 291 load-in facility where the tanker trucks pull in to be emptied. The tent had previously been used for housing the soil washing operations.	18.40 Metric Tons	SAN	7,395
Recycle/Reuse	A box of powder dispenser soap was sent for reuse.	<0.01 Metric Tons	SAN	10
Recycle/Reuse	Argon cylinders were returned to a vendor for reuse.	4.90 Metric Tons	SAN	500
Recycle/Reuse	Cardboard is collected and recycled by an offsite vendor.	31.83 Metric Tons	SAN	4,140
Recycle/Reuse	Cement from the remedial action of the crib was used as fill in the 183-F Clearwell.	87.40 Metric Tons	SAN	3,060
Recycle/Reuse	Compressed gases were excessed.	4.12 Metric Tons	SAN	500
Recycle/Reuse	Compressor oil was recycled.	0.03 Metric Tons	SAN	6
Recycle/Reuse	Copper and brass were collected by an offsite for vendor for recycling.	27.89 Metric Tons	SAN	6,970
Recycle/Reuse	Crushed fluorescent tubes were shipped to an offsite vendor for recycling.	5.52 Metric Tons	SAN	660
Recycle/Reuse	Crushed oil filters were sent to a recycler for metal recovery.	0.18 Metric Tons	SAN	45

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$) Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Demolition waste (concrete, inert demolition debris) is used as fill for the clearwells.	117.93 Metric Tons	SAN	45,560
Recycle/Reuse	During the 183-H Solar Evaporation basins Decommissioning and Deactivation activity, the road was removed and the asphalt was used as fill in the 183-H Clearwell.	192.30 Metric Tons	SAN	6,730
Recycle/Reuse	Eye glasses, hearing aids, and lenses were provided to the Lion's Club for reuse.	0.02 Metric Tons	SAN	3
Recycle/Reuse	Ferrous metals were sent to an offsite recycler.	3823.83 Metric Tons	SAN	955,960
Recycle/Reuse	Floor Dry was transferred to janitorial services.	0.03 Metric Tons	SAN	209
Recycle/Reuse	Fluorescent tubes were sent to an offsite recycler.	8.23 Metric Tons	SAN	990
Recycle/Reuse	Hardwood lab bedding was transferred to facility maintenance for landscaping.	0.36 Metric Tons	SAN	300
Recycle/Reuse	Hydraulic oil was recycled onsite for reuse.	2.47 Metric Tons	SAN	500
Recycle/Reuse	Laboratory equipment was transferred to a mobile sampling group.	0.50 Metric Tons	SAN	2,240
Recycle/Reuse	Leachate from the Environmental Restoration Disposal Facility is collected and used as a soil compaction and dust suppressant at the facility.	106.50 Metric Tons	SAN	7,000
Recycle/Reuse	Moving boxes are redeployed rather than disposed or recycled.	5.11 Metric Tons	SAN	5,570
Recycle/Reuse	Non-ferrous metals were sent to an offsite recycler.	126.81 Metric Tons	SAN	81,165
Recycle/Reuse	Non-PCB light ballasts were sent to an offsite recycler.	0.90 Metric Tons	SAN	53
Recycle/Reuse	Paper is collected for recycling by a local vendor.	411.10 Metric Tons	SAN	53,440
Recycle/Reuse	Pressurized containers of carbon dioxide were returned to the vendor.	0.02 Metric Tons	SAN	800
Recycle/Reuse	Propylene glycol was recycled onsite.	0.15 Metric Tons	SAN	20
Recycle/Reuse	Recycled 600 gallons of surplus oil and shipped direct offsite.	6.60 Metric Tons	SAN	1,279
Recycle/Reuse	Soluble oil was recycled for use onsite.	0.02 Metric Tons	SAN	4
Recycle/Reuse	Telephone books were collected for recycling. (Revenue was donated to local school)	2.60 Metric Tons	SAN	340
Recycle/Reuse	The shroud around an air conditioning unit was recycled.	<0.01 Metric Tons	SAN	1
Recycle/Reuse	Tires are returned to a vendor for retreading through a closed-loop contract.	28.07 Metric Tons	SAN	25,830
Recycle/Reuse	Toner cartridges were sent to a local vendor for recycling.	13.77 Metric Tons	SAN	2,750

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Twenty four 55 gallon drums of concrete from the decommissioning of a well were reused as road bed material.	4.53 Metric Tons	SAN	1,380
Recycle/Reuse	Twenty one carbon traps were recycled for reuse.	<0.01 Metric Tons	SAN	75
Recycle/Reuse	Unneeded chemicals were returned to the manufacturer.	0.44 Metric Tons	SAN	60
Recycle/Reuse	Unneeded halon was excessed for reuse.	0.05 Metric Tons	SAN	200
Recycle/Reuse	Unneeded water fountain was excessed.	0.01 Metric Tons	SAN	13
Recycle/Reuse	Unusable software is shipped to a plastics recycler.	32.59 Metric Tons	SAN	4,240
Recycle/Reuse	Unused granulated activated carbon is sent off site to a commercial vendor.	8.39 Metric Tons	SAN	2,940
Recycle/Reuse	Used appliances and furniture were sent to a recycler.	77.87 Metric Tons	SAN	19,470
Recycle/Reuse	Used oil is returned to a vendor for re-refining under a closed-loop contract.	54.46 Metric Tons	SAN	10,900
Recycle/Reuse	Waste water is recycled and reused at the water treatment plant at 283W.	14205.00 Metric Tons	SAN	0
Recycle/Reuse	Wood was taken to a local landfill for chipping and reuse.	346.29 Metric Tons	SAN	45,020
Recycle/Reuse	Worker coveralls were determined by the laundry contractor as not fit for use or laundering. The bags were sorted to minimize waste and usable coveralls were recovered.	0.27 Metric Tons	SAN	8,000
Segregation	At the 324 Facility, lead containing articles such as light bulbs, fuses, solder, etc. were not segregated from the low-level waste stream. Due to this, 50 55-gallon drums and 2 4'x 4'x 8' burial boxes were packaged designated and managed as low-level mixed waste. Segregation practices have been implemented to reduce the mixed low-level waste stream. These practices have reduced the mixed waste being generated at the facility by at least 75%.	4.16 Cubic Meters	MLLW	19,500
Segregation	Segregation of canyon cleanup waste saved disposal of mixed waste.	6.37 Cubic Meters	MLLW	88,000

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Source Reduction	Source reduction through product substitution is the primary waste minimization tool used at Waste Receiving and Processing to reduce the use of regulated materials. As new materials are proposed an evaluation process is conducted to determine the most appropriate product based upon worker safety, product effectiveness and waste regulation. Routinely, chemicals in the Waste Receiving and Processing inventory are reviewed and substitutes considered. In 1997 a total of 40 product substitutions were facilitated through the evaluation process.	0.04 Metric Tons	HAZ	1,000
Source Reduction	Substituted C-Cell rechargeable batteries for alkaline batteries.	0.01 Metric Tons	HAZ	2,000
Source Reduction	Return On Investment funded the installation of a corrosion probe in 241-AN-107. The probe will monitor the tank for corrosion control thereby reducing the volume of sodium hydroxide needed to be added for corrosion control.	6.60 Cubic Meters	HLW	2,216,667
Source Reduction	Approximately 800 gallons of water was slated for disposal through the Effluent Treatment Facility. The transport tanker has a capacity of 4000 gallons and must be transported full. Alternative methods were deployed that eliminated the addition of 3200 gallons of water to the waste stream.	12.12 Cubic Meters	LLW	23,043
Source Reduction	During calendar year 1997, approximately 131,235 square meters (1,412,648 square feet) of radiological contaminated areas were effectively cleaned to lower levels. This cleaning allowed easier access for personnel and resources by reducing the personal protective equipment (PPE) needed for entry. Savings are primarily a reduction in contaminated PPE and equipment requiring disposal. NOTE: This accomplishment was not funded but achieved through excellent conduct of operation practices.	3.00 Cubic Meters	LLW	125,000
Source Reduction	Reduced number of samples taken on four stacks for iodine emissions. Fewer samples reduces the amount of sampling waste.	0.08 Cubic Meters	LLW	39,945
Source Reduction	Site Health Physics Technician's survey all the compactable waste, separating the non-contaminated material into containers that will be disposed of in the landfill rather than with the LLW.	5.70 Cubic Meters	LLW	12,940

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Source Reduction	Surveyed and cleaned the area to down post from a Radiological Control Area to an Radiological Buffer Area. This reduced the amount of LLW generated from area entry and exit requirements.	4.92 Cubic Meters	LLW	98,616
Source Reduction	The resin change out schedule was revised to optimize operation of the N Springs pump and treat system. Revision of the schedule resulted in a source reduction of waste generated from fourteen containers to four during a fifty day period.	22.00 Cubic Meters	LLW	41,800
Source Reduction	A waste mercury thermometer was released from radiological controls and placed into hazardous waste satellite drum instead of being placed into a low level radioactive waste drum. This activity avoided the subsequent management of the low level waste as radioactive mixed waste.	0.26 Cubic Meters	MLLW	4,100
Source Reduction	Disposal of Purex towers from the T-Plant canyon saved RMW costs for burial, after radioactive characterization, sampling, process knowledge, and engineering calculations redesignated the towers as LLW. The towers were a direct burial shipment, saving costs of packaging and size reduction.	54.20 Cubic Meters	MLLW	747,000
Source Reduction	In late January 1997, the new project W-252 closed loop cooling system for the cesium and strontium capsule storage pool cells at Waste Encapsulation/Storage Facility was brought online. The new system replaced the old single-pass system. The new system provides for recirculation of the cooling water to maximize the entire cooling capacity of the water. The project also rerouted the liquid discharges from B Pond to the 200 Area Treated Effluent Disposal Facility.	2500000.00 Cubic Meters	MLLW	6,800,000
Source Reduction	In the past the 324 Facility used aerosol products which contained 1,1,1-trichloroethane or trichloroethylene on rags to decontaminate manipulator parts. The facility now uses a product which is not regulated when used on rags reducing the facility's mixed waste stream.	<0.01 Cubic Meters	MLLW	0
Source Reduction	Return On Investment funded the isolation of 151-S Diversion Box to prevent seepage of precipitation into the structure.	16.10 Cubic Meters	MLLW	28,255

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Source Reduction	The leachate system in Cell 2 of the Environmental Restoration Disposal Facility was isolated from Cell 1. The leachate derived from Cell 2 is not a hazardous waste since waste has not yet been placed into the cell. The result of this activity reduced the amount of leachate generated for disposal at the Effluent Treatment Facility.	1895.00 Cubic Meters	MLLW	125,000
Source Reduction	During the grading activities, the project took clean dirt from an adjacent berm pile, instead of bringing backfill soil from borrow pits. Money was saved on equipment use, fuel, oil, tires and labor costs (Savings shown are labor savings only).	<0.01 Metric Tons	SAN	48,500
Treatment	Contaminated compactable waste, such as cloths, gloves, plastic, are separated and collected in yellow waste bags. When enough bags are collected to justify compaction, they are sent to the machine and reduced to a comparatively small amount of waste.	1.00 Cubic Meters	LLW	2,200
Treatment	K Basins acquired the services of Allied Technology Group (ATG) for the compaction of empty fuel canisters. Compacting proved to be a substantial savings over non-compacting. Project life is to FY2001.	132.32 Cubic Meters	LLW	247,373
Treatment	Low Level Waste is compacted prior to shipment from the 327 Facility at approximately 10:1 compaction.	31.38 Cubic Meters	LLW	8,400
Treatment	Routine LLW, generated from routine zone entries, consisting of paper, plastic, rubber, metal and wood, is compacted by Allied Technology Group. Project life is to FY2001 and cost savings are reflected.	99.41 Cubic Meters	LLW	187,143
Treatment	Sent to ATG for compaction.	1161.00 Cubic Meters	LLW	102,572
Treatment	Solid low-level waste is generated in the laboratory and consists of compactible waste such as gloves, paper, soft plastics, and cloth. This material is sent to an off-site contractor for compaction. A volume reduction ratio of 8:1 is achieved.	79.25 Cubic Meters	LLW	203,800
Treatment	The 324 Facility compacts category 1 LLW such as paper, plastic, cloth, rubber, etc. in 55-gallon drums prior to shipment. The compaction ratio is approximately 3 to 1 which equates to approximately a 66 percent volume reduction of this waste stream.	16.64 Cubic Meters	LLW	16,472

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$) Cost Savings
Richland Operations/Hanford				
Treatment	Severed and disposed of jumpers to reduce the volume sent for disposal.	140.08 Cubic Meters	MLLW	915,300
Treatment	Water from the 100 N Emergency Dump Basin was transported to the Effluent Treatment Facility for treatment prior to disposal.	208.00 Cubic Meters	MLLW	0
Treatment	Water is collected from the leachate collection systems at the Effluent Retention Disposal Facility and sent to the Effluent Treatment Facility for treatment prior to disposal.	8395.59 Cubic Meters	MLLW	0
Treatment	Implemented Return On Investment project in 300 Area Treated Effluent Disposal Facility to provide treatment and recycling for a waste stream that was previously disposed of. Waste type reduced: absorbed oil-water mixture of sanitary waste.	13.10 Metric Tons	SAN	19,000
Treatment	The oil and water mixture is sent to the 300 Area for separation.	6.80 Metric Tons	SAN	3,143
Pacific Northwest National Laboratory				
Recycle/Reuse	Aerosol cans are sent to the Hanford Site Centralized Consolidation Recycle Center for recycling.	*0.04 Metric Tons	Haz	1,300
Recycle/Reuse	All unneeded pesticide chemicals were excessed to a certified applicator for reuse instead of disposal.	0.75 Metric Tons	HAZ	24,300
Recycle/Reuse	Circuit boards were recycled through an off-site vendor.	0.27 Metric Tons	HAZ	8,900
Recycle/Reuse	Distillation and reuse of formalin, alcohol, xylene, and methanol.	3.50 Metric Tons	HAZ	28,850
Recycle/Reuse	Drums that would have been disposed of as hazardous waste are returned to the chemical vendors. Drums were returned to Chemax/Great Western (26 drums), Tri-City Oil (4 drums), and King Soft Water (19 drums). An average weight for the drums is 9 kgs.	0.44 Metric Tons	HAZ	14,100
Recycle/Reuse	Lead Acid and Gel Cell Batteries were sent to the Hanford Site Centralized Consolidation Recycle Center for recycling.	*5.19 Metric Tons	HAZ	166,000
Recycle/Reuse	Solvent from maintenance activities is recycled through an on-site distillation unit.	0.04 Metric Tons	HAZ	1,300
Recycle/Reuse	Ten computer chips were given to the Richland School District for use in their computers.	<0.01 Metric Tons	HAZ	0
Recycle/Reuse	The Chemical Redistribution Center collected and redistributed chemicals throughout the Laboratory.	0.18 Metric Tons	HAZ	6,000

*Quantity sent for recycle. Recycled quantity and cost savings included in Hanford Site numbers.

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$ Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Waste oil from maintenance activities is recycled through an off-site vendor.	2.36 Metric Tons	HAZ	75,600
Source Reduction	The Land & Resources Department of Environmental Technology Division purchased a new color plotter for topographical maps. The former plotter required extensive maintenance and generated ink waste. Maintenance of the new plotter is minimal and it generates no ink waste.	0.02 Metric Tons	HAZ	11,000
Treatment	Chemicals which would have been disposed of as hazardous waste were treated and disposed of as non-regulated waste.	0.30 Metric Tons	HAZ	9,500
Treatment	Organic destruction process; organic chemicals are oxidized so they are no longer considered hazardous.	<0.01 Metric Tons	HAZ	13
Segregation	Due to incorrect packaging, pieces of a hood were mixed with contaminated materials when shipped to PNNL. The materials were segregated greatly reducing the LLW volume.	18.00 Cubic Meters	LLW	29,000
Source Reduction	Ethanol was substituted for methanol in the cleaning procedure for experimental equipment. Thus, the rags used for cleaning no longer have to be disposed as mixed waste but as low level waste.	0.25 Cubic Meters	MLLW	1,600
Treatment	Chemicals which would have been disposed of as mixed waste were treated and disposed of as low-level waste.	<0.01 Cubic Meters	MLLW	100
Recycle/Reuse	Concrete from remodeling the main entrance to the Research Operations Building was sent for recycle through Central Pre-Mix, rather than landfilled. Also, the new concrete used in the remodeling contains about 50% recycled materials, including aggregate from old concrete, as well as fly ash, iron and aluminum slag, silica sand, and silica flue, which come predominantly from coal generation.	5.50 Metric Tons	SAN	2,000
Recycle/Reuse	Filters and chemicals for water treatment were returned to the vendor through an arranged contract. Five 200-pound reverse osmosis membrane filters were returned, as well as 5 drums of chemical/water mixtures.	1.50 Metric Tons	SAN	2,500
Recycle/Reuse	Fluorescent tubes were sent to the Hanford Site Centralized Consolidation Recycle Center for recycling.	*1.56 Metric Tons	SAN	2,700

*Quantity sent for recycle. Recycled quantity and cost savings included in Hanford Site numbers.

RICHLAND OPERATIONS ACCOMPLISHMENTS TABLE

Pollution Prevention Activity	Accomplishments	Waste Reduction	Waste Type	(\$). Cost Savings
Richland Operations/Hanford				
Recycle/Reuse	Obsolete software and software documentation are sent to GreenDisk. GreenDisk degausses and reformats the diskettes for resale and recycles the scrap paper from the packaging and documentation.	21.90 Metric Tons	SAN	37,000
Recycle/Reuse	Recycling of aluminum cans is completed by the janitors, who retain the funds for their efforts.	1.00 Metric Tons	SAN	1,700
Recycle/Reuse	Recycling of white office paper (104,180 kgs), cardboard (14,470 kgs), mixed paper (15,330 kgs), newspapers/magazines (44,040 kgs), glass (307 kgs), tin (116 kgs), and plastic (143 kgs).	178.60 Metric Tons	SAN	16,600
Recycle/Reuse	Used toner cartridges are sent off-site for recycle and a discount on new cartridges is given back to Pacific Northwest National Laboratory. Over 1800 cartridges were recycled this year.	8.20 Metric Tons	SAN	105,000
Source Reduction	Benefits' open enrollment was conducted electronically instead of through forms as done in past years. Also, Pacific Northwest National Laboratory piloted and purchased an electronic survey tool, which will replace paper surveys where applicable.	0.55 Metric Tons	SAN	930

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