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FLUOR DANIEL

Fluor Daniel Hanford, Inc.
P.O. Box 1000
Richland, WA 99352

December 2, 1999

FDH-9958687

Distribution

Ladies and Gentlemen:

HANFORD'S POLLUTION PREVENTION PROGRESS REPORT 1999

It is my pleasure to present to you *Hanford's Pollution Prevention Progress Report 1999,* documenting successes of Fluor Daniel Hanford, Inc. and its Project Hanford Management Contractor major subcontractors and the prime contractors Bechtel Hanford Inc., Hanford Environmental Health Foundation, Lockheed Martin Hanford Company, and Pacific Northwest National Laboratory. The compilation of successes included in the report range from the complex, with stabilization of Category III waste, to the simple with the reuse of chemicals. They all were driven by employee initiative and are the cornerstone of the Pollution Prevention/Waste Minimization program at Hanford.

Your contribution has helped in meeting the most aggressive waste reduction and recycling goals to date. In fiscal year 1999 alone, the individual accomplishments generated cost savings/avoidances of over $49 million in reductions of:

- Over 64,000 cubic meters low-level waste
- Over 800 cubic meters mixed waste
- Over 95 metric tons hazardous waste
- Over 4,200 metric tons sanitary waste
- Over 3,000,000 kilowatt hours energy

Thank you for your continued participation and support for pollution prevention and waste minimization. Each pollution prevention accomplishment is a success in waste reduction and cost savings. If there are any questions contact M. D. Betsch, of my staff, at 372-1627.

Very truly yours,

E. S. Aromi, Vice President
Waste Management Project
Fluor Daniel Hanford, Inc.

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Pollution Prevention Progress Report 1999

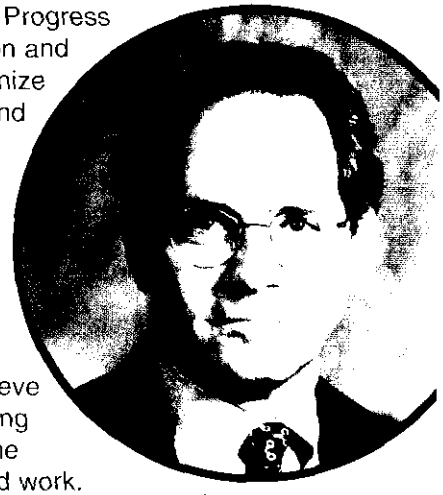
HANFORD

M.D. Betsch
Waste Management Hanford

Z. Pritchett
Summer Intern for
Waste Management Hanford

A Message from the Managers

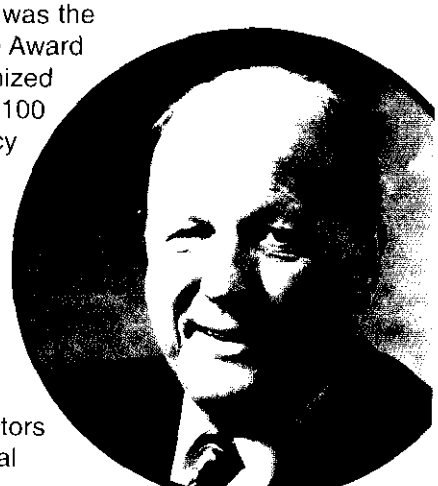
The Richland Operations Office (RL) and Office of River Protection (ORP) are pleased to issue the attached Pollution Prevention Progress Report. We have just met the most aggressive waste reduction and recycling goals to date and are publishing this report to recognize the site's progress, and to ensure it will sustain success beyond Fiscal Year 2000. This report was designed to inform the public and other DOE sites about the progress that has been made by RL and ORP in Waste Minimization (WMin) and Pollution Prevention (P2).



Keith Klein, Manager DOE, Richland Operations Office

RL, ORP and their contractors are committed to protecting the environment, and we reiterate pollution prevention should continue to be at the forefront of the environmental cleanup and research efforts. As you read the attached report, we believe you will see a clear demonstration of RL and ORP's outstanding performance as it has been responsible and accountable to the nation, its employees, and the community in which we live and work. Progress has been sitewide, and there is real evidence of the commitment that all employees have for environmental stewardship.

The report provides useful information about the U.S. Department of Energy's (DOE's) environmental policy and programs, and contains countless examples of waste minimization projects. This year was the first year our site received the White House Closing the Circle Award in the category of Affirmative Procurement. This Award recognized our site for designing a comprehensive strategy for achieving 100 percent purchases of the U.S.Environmental Protection Agency designated recycled items. DOE-Headquarters also acknowledged the site in 1999 for its public outreach efforts in communicating pollution prevention to Hanford Site employees and the community. Our site is truly a recognized leader in outreach as it has kept this title for two consecutive years. In previous years, we received the White House Closing the Circle Honorable Mention in Affirmative Procurement and several other National DOE Awards. Through partnership with the local community and stakeholders, the site and its contractors have a clear sense of direction toward achieving environmental protection, cleanup, and research.



Richard French, Manager DOE, Office of River Protection

Keith A. Klein
Manager

Richard T. French, Manager
Office of River Protection

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Hanford's Pollution Prevention Policy

[illegible] the Secretary of Energy, Hazel O'Leary, established sitewide pollution prevention goals, set forth to reduce the generation of waste and minimize the impact to the environment. Hanford is on track for achieving these goals for all waste streams by the end of Calendar Year (CY) 1999. Following the achievement of these goals, Secretary of Energy Bill Richardson will establish more aggressive goals for beyond CY 2000.

President Clinton has issued several new Executive Orders that proclaim the Federal Government's role as the national leader in pollution prevention. The U.S. Department of Energy (DOE), Richland Operations Office (RL), and Office of River Protection (ORP) are also firmly committed to ensuring incorporation of all Departmental and National pollution prevention goals in the daily conduct of its business.

Pursuant to requirements set forth in Executive Order 12856, it is the policy of DOE to manage all facilities and operational activities in a manner that will reduce the generation of wastes, and eliminate, or minimize, pollutants released to environmental media. To execute this policy, DOE and contractor personnel shall incorporate waste minimization and pollution prevention performance measures and goals into all programmatic and operational activities, including, but not limited to, the design, construction, and operation of new facilities, "new product acquisition," decontamination and decommissioning of surplus facilities, and other waste generating activities; i.e., site environmental restoration and remediation work.

As a part of the implementation process, DOE and its contractors will follow the four-point priority system (source reduction, recycling, treatment, and disposal) instituted by the Pollution Prevention Act of 1990. Executive Order 12856 directs that voluntary goals be set to reduce total releases and the offsite transfer of Toxic Chemical Release Inventory chemicals reported under the Emergency Planning and Community Right-to-Know Act. DOE and its contractors will develop plans and goals to eliminate or reduce unnecessary acquisition of products containing extremely hazardous substances, or toxic chemicals, and to delineate progress in reaching these goals in annual progress reports to the RL Waste Programs Division (WPD).

DOE and its contractors will also comply with Executive Order 13101, issued on September 14, 1998, which requires Federal agencies to expand waste prevention and recycling programs and implement affirmative procurement programs for recycled, biobased, and energy efficient materials, including the procurement of other environmentally preferable products and services.

DOE and its contractors will implement Executive Order 12843, issued on April 21, 1993, which requires Federal agencies to minimize and allow for phaseout of Class I and Class II ozone-depleting substances.

In conclusion, DOE will establish measures and goals in accordance with the above cited Executive Orders and consistent with pollution prevention and waste minimization requirements contained in the DOE 1996 Pollution Prevention Program Plan (DOE/S-0118), the Pollution Prevention Act of 1990, the Resource Conservation and Recovery Act, Code of Federal Regulations Chapter 40, Part 264, the Washington Administrative Code Chapters 173-303, and where applicable DOE Order 5400.1 and DOE Order 435.1. In addition, DOE's contractors are expected to achieve the Secretary of Energy WMin/P2 goals and other subsequent WMin/P2 goals issued by DOE, Headquarters (HQ).

We must continue to show leadership in the WMin/P2 discipline, recognizing that our compliance will be strengthened in the future through the U.S. Environmental Protection Agency, the State of Washington, HQ waste minimization guidance, and DOE Orders. Pollution prevention must be an integral part of the way work is performed on this site. Everyone's contribution is necessary for achievement of environmental excellence on site and in the community.

The responsibility of ensuring compliance with this policy has been assigned to RL WPD. If you have any questions concerning this matter, please contact us, or your staff may contact Anna V. Beard, WMin/P2 Program Manager, on (509) 376-7472.

Keith A. Klein, Manager
Department of Energy, Richland Operations Office

Richard T. French, Manager
Department of Energy
Office of River Protection

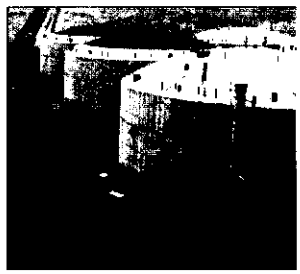
Hanford History

The Hanford Site, managed by the U.S. Department of Energy's Richland Operations Office (DOE-RL) and Office of River Protection (ORP), encompasses 560 square miles. Five prime contractors (Hanford Environmental Health Foundation, Fluor Daniel Hanford, Battelle, Bechtel Hanford, and Lockheed Martin Hanford Corporation) implement the day-to-day operations of the Site. Hanford Site's original mission, the production of nuclear materials for the nation's defense programs, lasted more than 40 years, and like most manufacturing operations, the Hanford Site's operations generated large quantities of waste and pollution. However, the by-products from Hanford Site operations pose unique problems, such as radiation hazards, vast volumes of contaminated water and soil, and many contaminated structures including reactors, chemical plants, and evaporation ponds.

Traffic jams of Army and construction vehicles, bringing a deluge of materials and manpower, sprang up in 1943 on the eastern Washington desert, where previously sagebrush, Russian thistle, black-eyed Susans and jackrabbits had ruled.

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 more than 2,100 metric tons of spent nuclear fuel stored on the Hanford Site, removing numerous structures, and dealing with significant solid-waste, ground water, and land-restoration issues.

Today, the Hanford Site's mission is to clean up the Site, provide scientific and technological excellence to meet global needs, and partner in the economic diversification of the region.



The 241-AW Tank Farm, consisting of six double-shell tanks that served the PUREX Facility, under construction in 1975.

[illegible]

- Eliminate and manage urgent risks by stabilizing and maintaining nuclear materials and facilities,
- Manage a large quantity and variety of wastes,
- Environmentally restore resources to enable other use, and
- Develop more cost-effective and less expensive technology to advance cleanup.

Dedication ceremonies in July 1944 for the "Day's Pay," a B-17 bomber bought for the Army Air Corps by Hanford workers, each of whom contributed a day's pay. The plane later served with the Eighth Air Force in England. In March 1945, its crew was decorated with the Air Medal, five oak leaf clusters, and two major battle stars.

Hanford workers converse over dinner in a cafeteria at the Hanford Construction Camp located at the old townsite built by Judge Cornelius Hanford. The camp housed 45,000 people at its peak in mid 1944. In the dining halls, a coffee pot raised over the head was the signal for a refill.

Secretarial Goal Progress

In May 1996, the Secretary of Energy established pollution prevention/waste minimization (P2/WMin) goals for the U. S. Department of Energy (DOE) Complex including the DOE Richland Operations Office (RL). Achievement of these goals, which use 1993 as a baseline year, is required by December 31, 1999. The goals are as follows:

For Routine* Operations

- Reduce by 50% the generation of low-level waste (LLW), mixed low-level waste (MLLW), and hazardous waste (HAZ)
- Reduce by 33% the generation of sanitary waste (SAN)
- Reduce by 50% toxic chemical releases.

For All Operations

- Recycle 33% of sanitary waste.

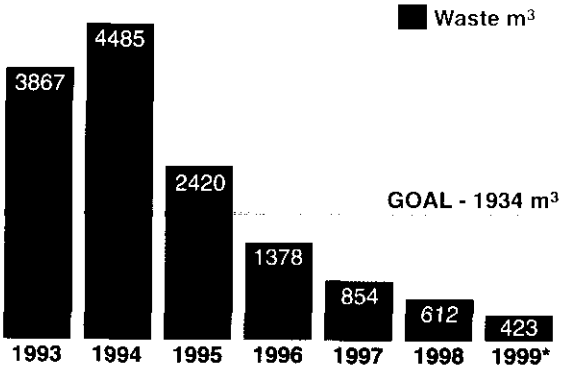
For Affirmative Procurement

- Increase affirmative procurement of U.S. Environmental Protection Agency (EPA)-designated recycled products to100%, except where they are not commercially available at a reasonable price or do not meet performance standards.

In Calendar Years 1997 and 1998 the Hanford Site, as a result of ongoing waste reduction activities, met or exceeded the Secretary of Energy's P2/WMin waste reduction and sanitary waste recycling goals.

* Routine Operations Waste - Normal operations waste produced from any type of production operation, analytical and/or Research and Development (R&D) laboratory operations; treatment, storage, disposal operations, 'work for others,' or any other periodic and recurring work that is considered ongoing in nature. 'Normal operations' refers to the type of ongoing process (production, R&D, etc.), not the specific activities that produced the waste. Periodic laboratory or facility cleanups that occur as a result of these processes are also considered normal operations.

Reduce Low-Level Waste Generation 50% by 12/31/99

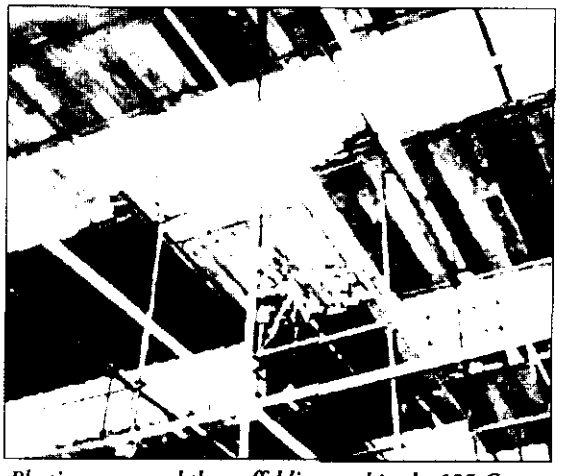


*Through third quarter CY 1999 only

Plastic Saves Scaffolding

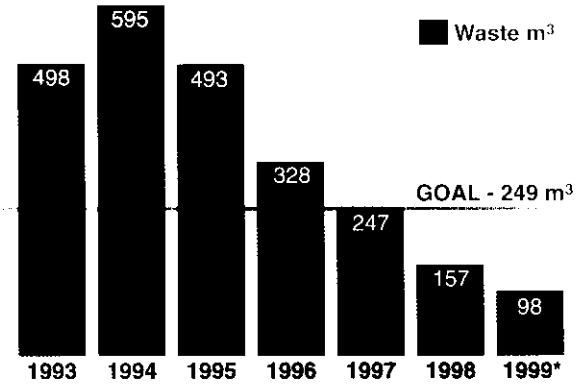
Plastic saves money, time, and scaffolding from radiological contamination, as discovered by a subcontractor working on the 105-C Interim Safe Storage Project.

The scaffolding used would have been disposed of as low-level waste, had it not been for the plastic sheeting the subcontractor used to wrap the scaffolding before entering radiologically controlled areas. A total of 27 cubic meters of waste was avoided, resulting in $74,000 saved.



Plastic wrap saved the scaffolding used in the 105-C project from radioactive contamination.

Reduce Mixed Low-Level Waste Generation 50% by 12/31/99

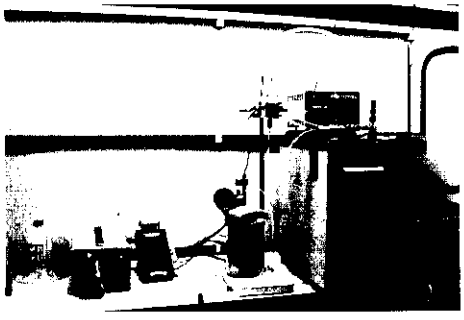


*Through third quarter CY 1999 only

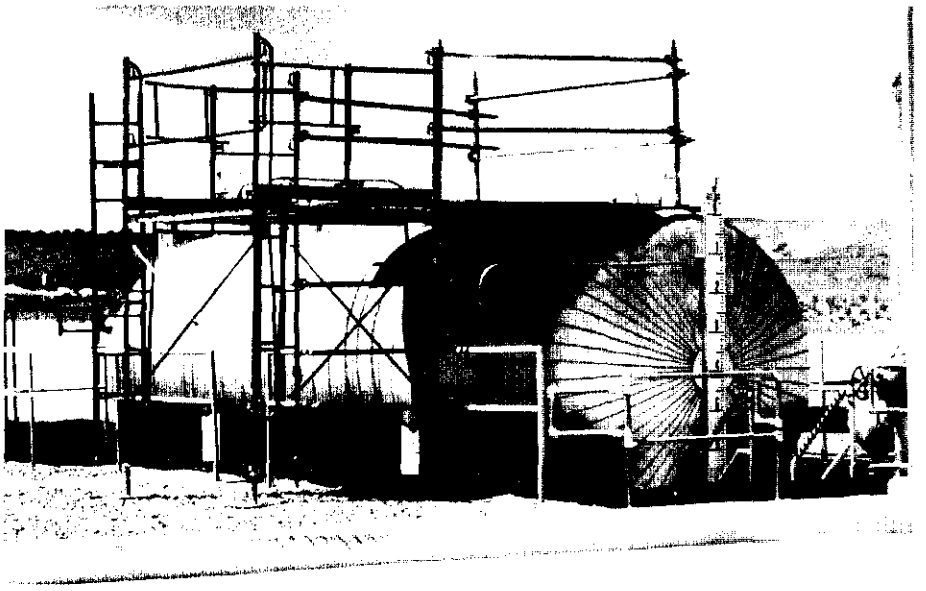
Redesign of Soil Test Reduces Mixed Low-Level Waste

A project designed to study the oxidation of tricholoethylene from mixed low-level contaminated soil required the use of a large amount of soil per test.

The process was redesigned. This new process reduces the total amount of soil used in the testing by 2.73 cubic meters. The savings of $600,000 also allows for more parameters to be investigated.



The soil test redesign reduces the amount of soil used by 2.73 cubic meters.



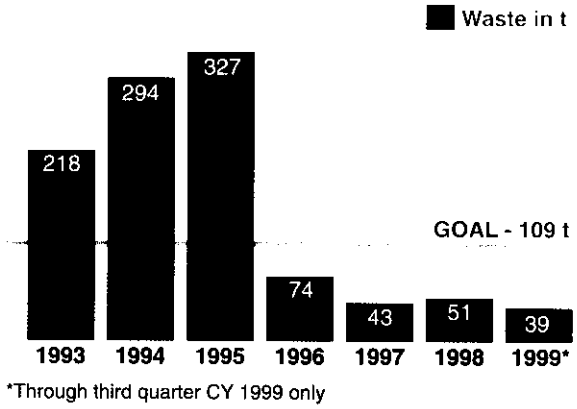
The leachate is stored in a tank before being used in the sprinkler system.

Leachate in a Sprinkler System

Rainwater passing through the Environmental Restoration Disposal Facility's lined trench containing listed waste was designated as a listed mixed low-level waste. Study and analysis of the leachate, however, determined that the water contained no evidence of being a listed waste and could perhaps be used for other purposes.

A de-listing petition based on the studies and analyses was approved by DOE-RL and the EPA, allowing for the use of the leachate in a sprinkler system and sprayed over the trench as dust suppressant.

Reduce Hazardous Waste Generation 50% by 12/31/99



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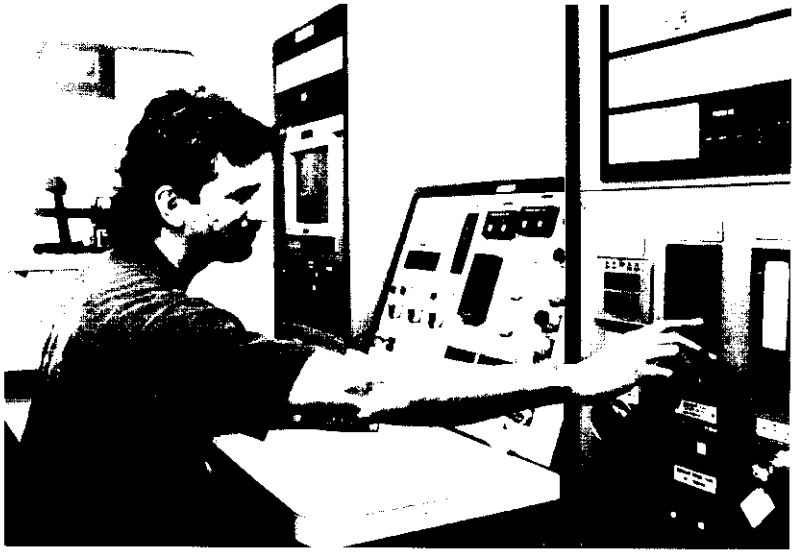
Sluicing Saves Water

In 1971, temperatures in excess of 99 degrees C (210 degrees F) were observed in 241-C-106 (Tank C-106). This raised a high level of concern; 6,000 gallons of water were added per month in an effort to cool the contents of the tank. In 1979, Tank C-106 was withdrawn from active service because of the continuing high temperatures emanating from the tank.

It was found that the high temperatures were coming from sludge that had accumulated in the tank. This sludge acted as an insulator to the tank's already heat-producing contents. On October 1, 1999, Pre-Sluicing Operations began.



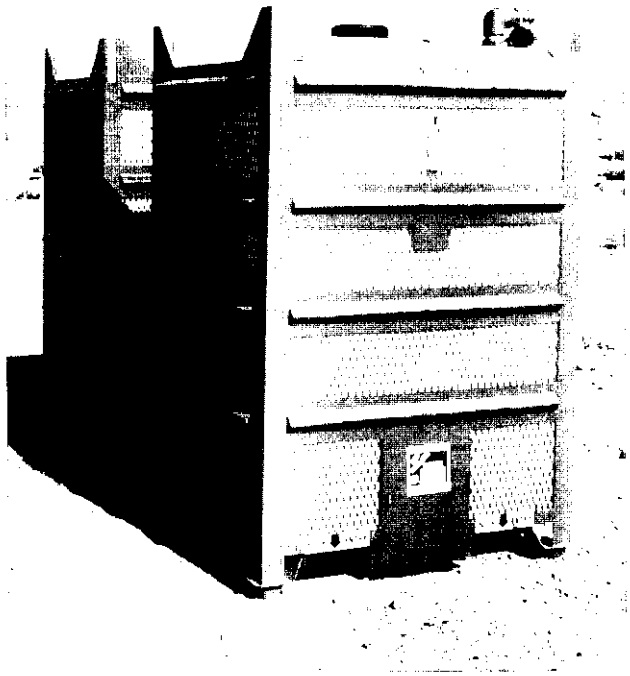
The control panels for the tank C-106 sluicing operations.

The removal of sludge from Tank C-106 resulted not only in a heat reduction, but an elimination of the cooling water previously added. This translated into a MLLW savings of 20 cubic meters, and an annual cost savings of $25,000.

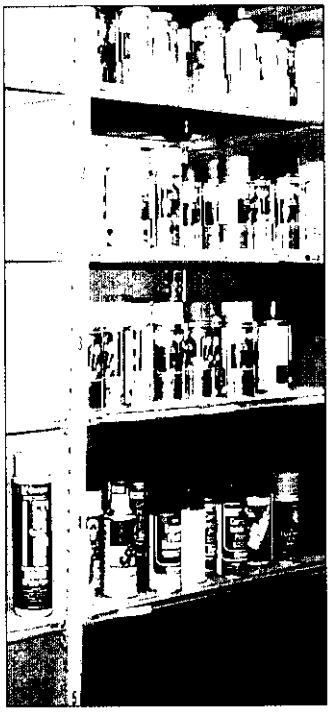
Dow X21 Resin Regenerated

Dow X21 resin, used in ion exchange columns at various pump and treat units on site to remove contaminates from ground water, would be disposed of after change-out.

Sending the resin to an offsite company specializing in decontamination of the resin was found to be more cost efficient. The regeneration of the resin saved 25.6 metric tons of resin from disposal and $330,600.



These resin containers are ready to be shipped off site for regeneration.

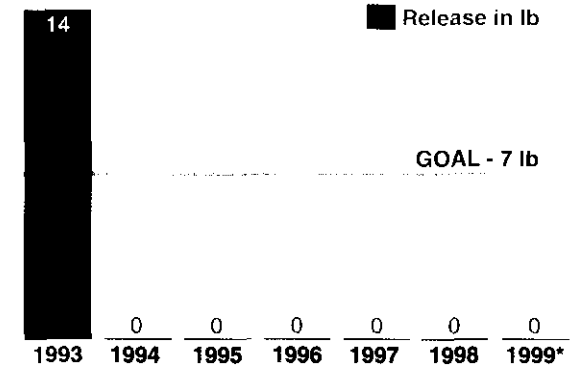


Centralized Consolidated Recycle Center

The Centralized Consolidation Recycling Center (CCRC) recycles fluorescent tubes, mercury vapor bulbs, incandescent bulbs, sodium bulbs, aerosol cans, DOP ballasts, large lead acid batteries, miscellaneous small batteries, shop towels, and mercury and mercury-containing equipment.

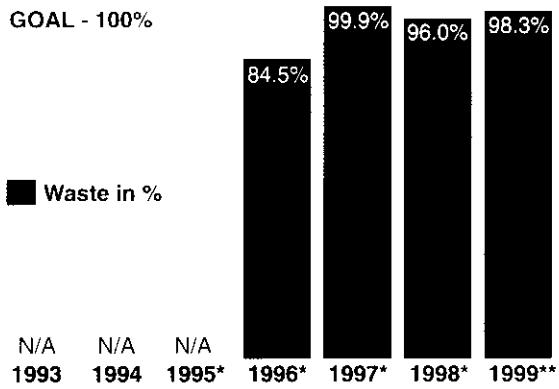
The Hanford facilities transport recyclables to the CCRC, and the CCRC disperses the materials for recycle off site. Shop towels are collected at the CCRC and laundered off site. The CCRC is a mechanism for recycling and reusing chemicals onsite. The Center distributes available products to approximately 140 potential users on site and then to other government agencies, including city, county, state and Federal. The products are offered to the business community if the products are not redeployed on site or to other government agencies.

Reduce Toxic Chemical Releases 50% by 12/31/99



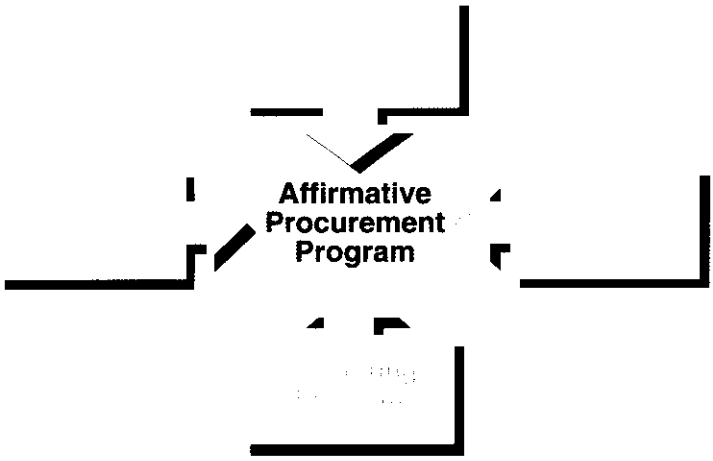
*Through third quarter CY 1999 only

Increase Affirmative Procurement of EPA-designated recycled products to 100% by 12/31/99



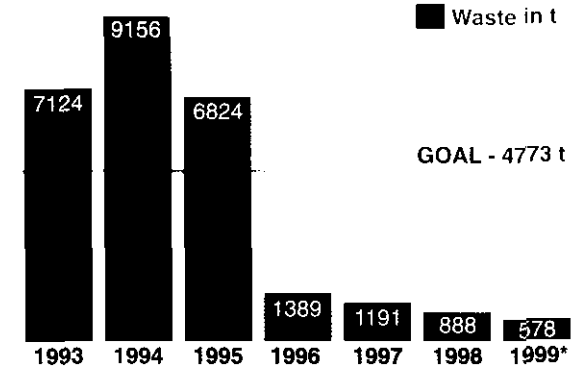
* Fiscal year data adjusted for exclusions
** Through third quarter FY 1999 only

AP Strategy



An Affirmative Procurement Strategy was developed to assist with implementation of the new Executive Order 13101, "Greening the Government," and to meet the Secretary of Energy's goal to purchase 100% of all EPA-designated items by the end of 1999. The strategy includes contractors working together to obtain the lowest price for recovered material products, hosting an Affirmative Procurement Open House, and information dissemination such as articles and training.

Reduce Sanitary Waste Generation 33% by 12/31/99



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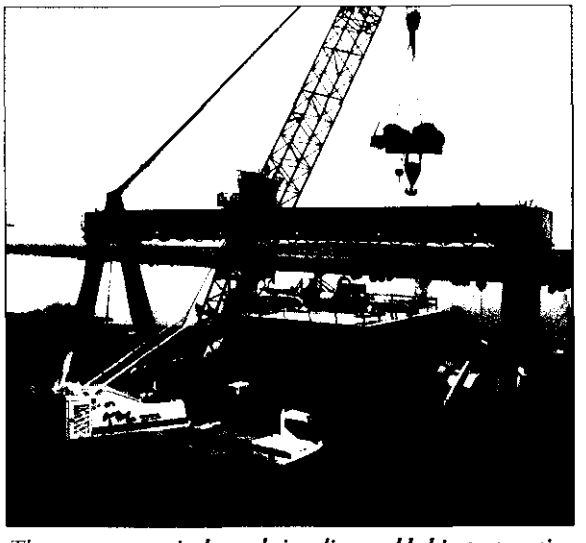


The gantry crane is shown being disassembled in preparation for transfer to Gunderson Northwest.

Gantry Goes to Gunderson

New jobs were created in the Tri-Cities as a result of the transfer of an unused 110-ton Gantry crane at the N Reactor. It was transferred to a local company, Gunderson Northwest. The Project Hanford Management Contractor (PHMC) invested money to help Gunderson Northwest by building a foundation for the crane and purchasing a new welding station.

The crane was used at the N-Reactor to support the reactor's pumping station and to unload barges. The crane has helped Gunderson increase jobs and output by 25%. The transfer saved the Site 99 metric tons of waste disposal and $450,900.

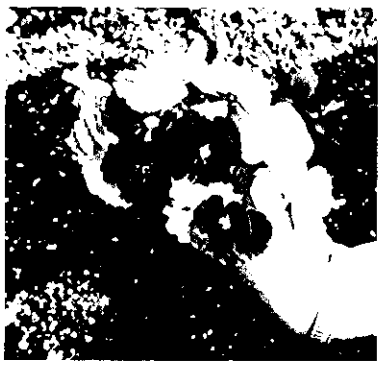
Flowers for Supply Reuse

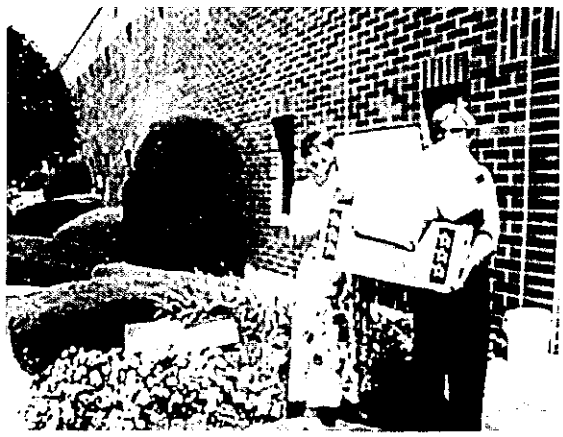
The supplies were distributed to those who could use them site-wide.

During downsizing, excess office supplies were stored in cabinets for reuse. However, tight budgets eventually required that the storage space be given up, leaving the unused supplies without a place to go.

The supplies were advertised across the DOE-RL complex, but some, such as binders, remained in excess afterwards. For these items, a contest was held to determine the largest quantity and most creative reuse.

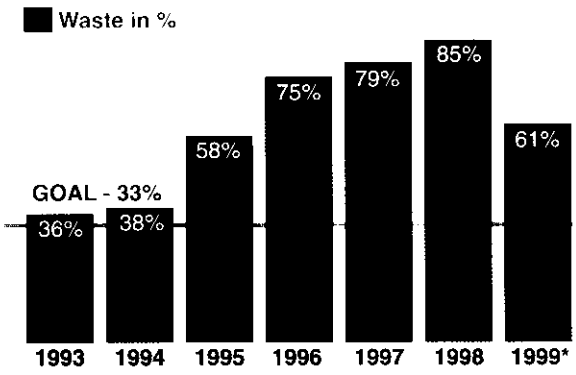
Staff who found a reuse for five binders were awarded a box of pansies as they were removed from the flower beds.





A box of pansies was given to staff who found a reuse for five binders.

Increase Sanitary Waste Recycling to 33% by 12/31/99



*Through second quarter CY 1999 only

Solid Waste Recycle Program

Hanford initiated its solid waste recycle program over 5 years ago. The recycle materials are picked up or transported to offsite recyclers who manufacture the materials into useable products. Among the materials recycled are: paper, cardboard, newspaper/magazines, glass, tin, plastic, software, transparencies, toner cartridges, and pallets/scrap wood. Over 590 metric tons were recycled in FY 1999 for a cost savings of nearly $220,000.

Items for recycle.

D&D/ER Ongoing Recycling

Bechtel Hanford Company, the decontamination and decomissioning/environmental restoration (D&D/ER) contractor, is responsible for cleanup of groundwater, contaminated soils, and inactive nuclear facilities under DOE's Environmental Restoration Program. This effort generates considerable waste, much of which is recycled. In FY 1999, Bechtel recycled 6,531 metric tons of concrete for a total cost savings of $2,144,800.

Concrete rubble for recycle.

Pollution Prevention/Energy Efficiency

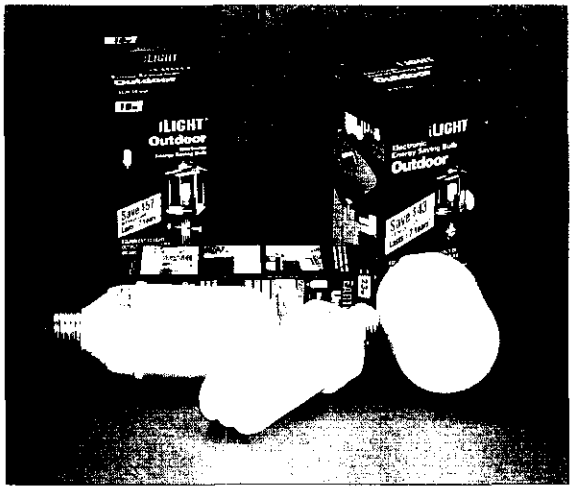
On December 10, 1998, Secretary of Energy Bill Richardson signed the first combined initiative for energy efficiency and pollution prevention at DOE facilities. The initiative is the phaseout by 2005 of all DOE chillers manufactured prior to 1984 that use Class I ozone-depleting substances. In December 1998, Secretary Richardson sent a memorandum to all heads of departmental elements stating his commitment to making the DOE a leader in pollution-free, energy-efficient operations in the Federal government.

On June 3, 1999, a new Executive Order, 13123, was issued by President Clinton to help meet the challenge of global warming by significantly improving energy efficiency in Federal buildings.

In 1999, the Hanford Site developed a strategy for integrating Pollution Prevention/Energy Efficiency (P2/E2) in future operations. Hanford found that P2/E2 together have more potential cost savings to offer Hanford.

Compact Fluorescent Lamps

A Return on Investment (ROI) project to retrofit incandescent lamps with compact fluorescent lamps was established in 1999. Over $98,000 was allocated towards this project to improve energy efficiency.



Compact fluorescent lamps replace incandescent lighting at Hanford.

Return on Investment

Waste minimization projects that provide a high rate of return on investment are eligible to receive funding through the Return on Investment (ROI) program. This funding is available to all Hanford contractors for pollution prevention projects.

Since 1994, Hanford has funded 57 ROI projects for a total implementation cost of $5.07 million and annual savings of nearly $155 million, which includes one ROI project with a one time cost avoidance of $117 million. More than 45 projects have been completed.

In fiscal year 1999, 12 ROI projects were continued and 8 ROI projects implemented.

Implementation
$5.07M

ROI Accomplishment:
New Stabilization Method Increases Trench Capacity

Low-level waste was stored in high integrity containers, tripling waste volumes. The containers were designed to stabilize high-activity waste and keep it stored in wet environments, an unnecessary measure taken for low-level waste stored in an arid area.

Hanford eliminated the use of the containers and developed a new stabilization method that used a special concrete formulation to stabilize and store the low-level waste.

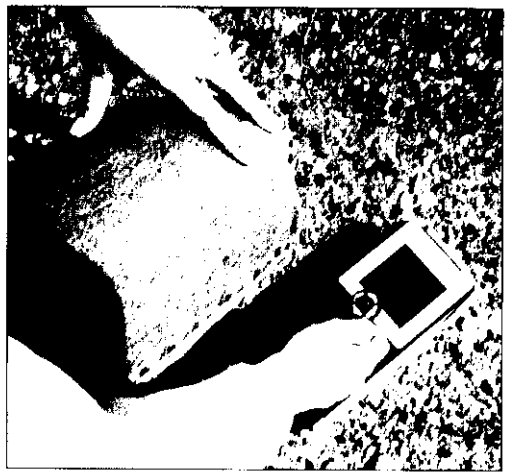
Use of this method decreased the waste associated with overpacking, correspondingly increasing the storage space in the burial trenches. The result was an annual reduction of 1,300 cubic meters of waste and a cost savings of $3,290,300.

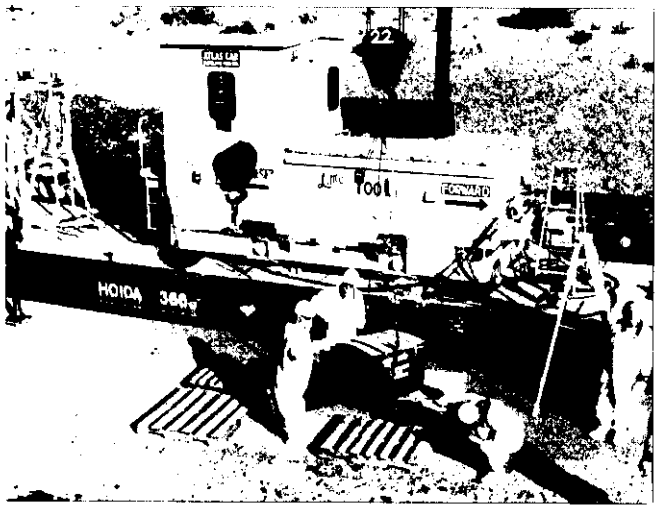
ROI (cont'd)

ROI Accomplishment
Gamma Spectrometer Increases Soil Reuse

Rate meters were used to help in remediation projects on site, providing the field technician with broad information regarding contaminants in the soil to be excavated. The cost associated with surveying and sampling the potentially contaminated soil, in addition to the time required for excavation, needed improvement.

To help solve this problem, three portable hand-held gamma-ray spectrometers were purchased. These spectrometers gave specific information about radionuclides found in the soil, allowing the technician to determine between releasable soil and contaminated soil. This resulted in waste savings of over 7,000 cubic meters and cost savings of over $693,000.



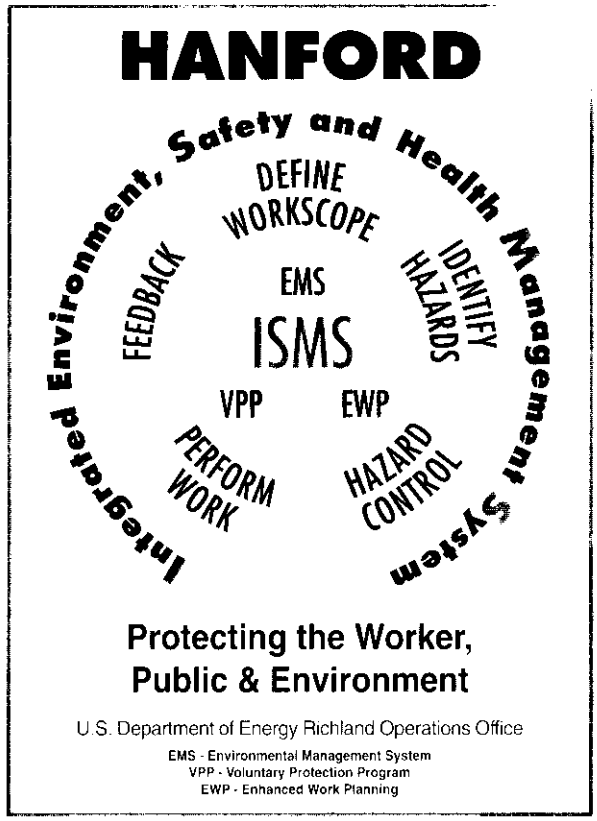


ROI Accomplishment
PUREX "Little Toot" Battery Removal

"Little Toot," a battery-operated 30-ton railroad locomotive, was used to push rail cars filled with failed equipment into an airborne radioactive area, the PUREX burial tunnels. The locomotive was powered with four 34-volt lead-acid batteries. Standard practice was to replace these batteries every 5 years and dispose of them as mixed waste.

The batteries were radiologically released for recycle, leading to the avoidance of 8 cubic meters waste and a net cost savings of $389,000.

ISMS



Recognizing that different initiatives have similar objectives and similar essential elements or principles, DOE headquarters has directed DOE sites to integrate all elements of ES&H for all work into one ES&H system designated as Integrated Environment, Safety, and Health Management System (ISMS). ISMS is a safety management system to systematically integrate safety into management and work practices at all levels.

These separate initiatives include Voluntary Protection Program (VPP), Enhanced Work Planning (EWP), and International Standards Organizations programs (EMS or ISO 14000). Each of these initiatives and programs play an important part in safety and environmental protection. The common elements include 1) worker involvement, 2) feedback and improvement, and 3) management responsibilities.

VPP

DOE initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. DOE-VPP outlines areas where DOE contractors and subcontractors can go beyond compliance with DOE Orders and the OSHA standards.

The program encourages the creative stretch for excellence through systematic approaches involving everyone in the contractor and subcontractor workforces at DOE sites.

EMS

The ISO 14000 series of standards developed by the International Organization for Standardization (ISO) provides a framework for developing effective Environmental Management Systems (EMS). The goals of implementing a new EMS are to control risks to and liabilities associated with an operation's effect on human health and the environment and to manage environmental activities to obtain a business advantage. The EMS helps to ensure that environmental protection is built into each work activity and therefore compliments and contributes to the implementation of ISMS.

EWP

The Department's Enhanced Work Planning (EWP) initiative focuses on improving processes for planning and performing work. This effort is an important element in implementing ISMS at the task level. EWP has produced numerous highly beneficial tools to strengthen analysis of hazards associated with performing work, improve quality of work packages and ensure that workers performing tasks provide input to preparation of the work package.

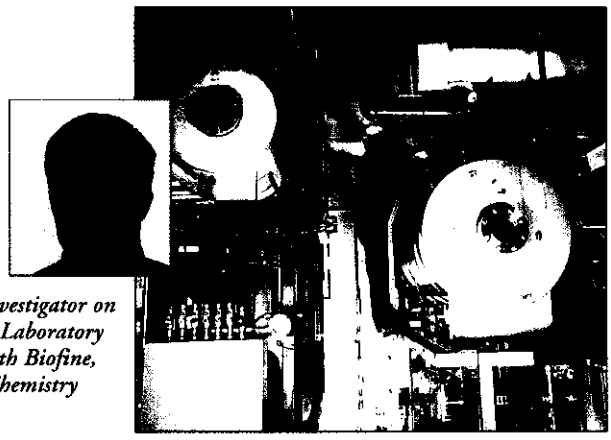
Recognition and Awards

A strategy to ensure products with recycled content are purchased at the Hanford Site has earned the first ever White House Closing the Circle Award for the Department of Energy Richland Operations Office. The Project Hanford Management Contract (PHMC) team and the DOE-RL Waste Management division developed the strategy. Input came from the PHMC companies, the Environmental Restoration Contract (ERC) companies, Pacific Northwest National Laboratory (PNNL), Hanford Environmental Health Foundation (HEHF), and DOE-RL. Hanford's was one of the very first strategies to be released within the DOE complex.

The Hanford Site was honored in 1999 to receive the U.S. DOE National Award for Pollution Prevention in the category of Public Outreach and Partnership. The outreach efforts included local involvement with Earth Day, the Hanford-sponsored Health and Safety Expo, Absorbent Olympics, and Pollution Prevention Week. Information was disseminated through the Hanford Homepage.

Pacific Northwest National Laboratory (PNNL), in conjunction with Biofine, Inc., a small Massachusetts company, earned one of only four Presidential Green Chemistry Challenge Awards granted to date in 1999.

The award was granted for the combination of technologies from PNNL, Biofine, and others. Biofine has developed a process that produces levulinic acid, an important multi-purpose chemical, from paper-mill waste at a fraction of current costs. The cost savings facilitated PNNL's ability to use the acid in their original multi-step catalytic process which converts levulinic acid into useful products, among which is an alternative fuel component. This fuel component, methyltetrahydrofuran, otherwise known as MTHF, can be used with ethanol and natural gas liquids to create a cleaner burning fuel for cars and trucks that produces less air pollution than present petroleum-based gasoline.



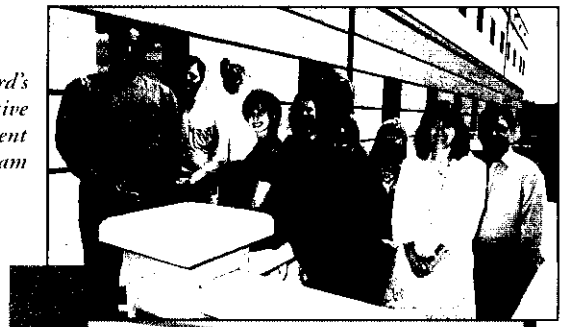
Douglas C. Elliott, principal investigator on the Pacific Northwest National Laboratory team, which, in conjunction with Biofine, received a Presidential Green Chemistry Challenge Award.

Employees pose with DOE Pollution Prevention National Awards.

Left to right: Janice Williams, FDH, Donna Merry, WMH, and Anna Beard, DOE-RL accept the White House Closing the Circle Award from Fran McPolland, Federal Environmental Executive and Dan Reicher, DOE's Environmental Executive.

Anna Beard, RL P2/WMin Program Manager, Richland Operations Office accepts the DOE Pollution Prevention National Award for Public Outreach and Partnership from the Secretary of Energy, Bill Richardson.

Hanford's Affirmative Procurement Team



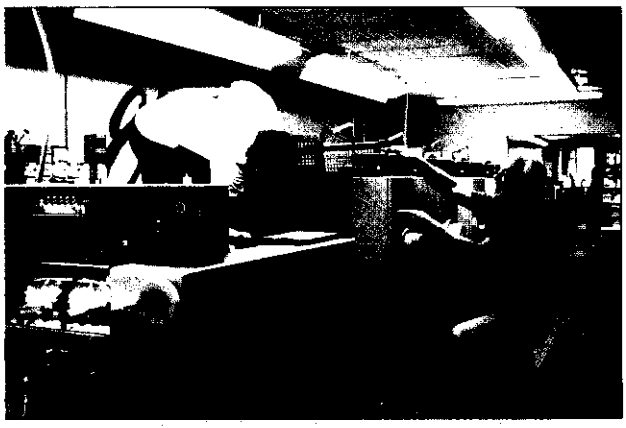
Employees pose for the White House Closing the Circle Award.

Outreach

EARTH DAY

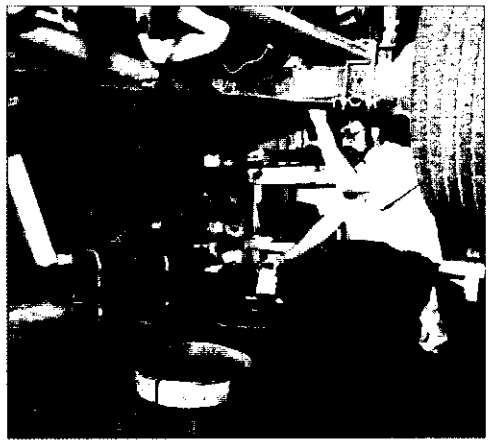
Earth Day is an annual community event held at Howard Amon Park including games, exhibits, music, food, school contests, cleanup programs and other related activities for all ages.

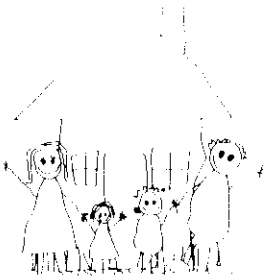
Hanford contractors display exhibits pertaining to pollution prevention successes for approximately 3,000 attendees.



The P2OE pollution prevention assessment pr[illegible] was transferred to small businesses in Richland and Kennewick, Washington, through a program co-sponsored by RL, the cities of Richland and Kennewick, and Waste Management Federal Services of Hanford, Inc. More than 30 businesses have participated since its inception in 1997.

SMALL BUSINESS ASSESSMENTS



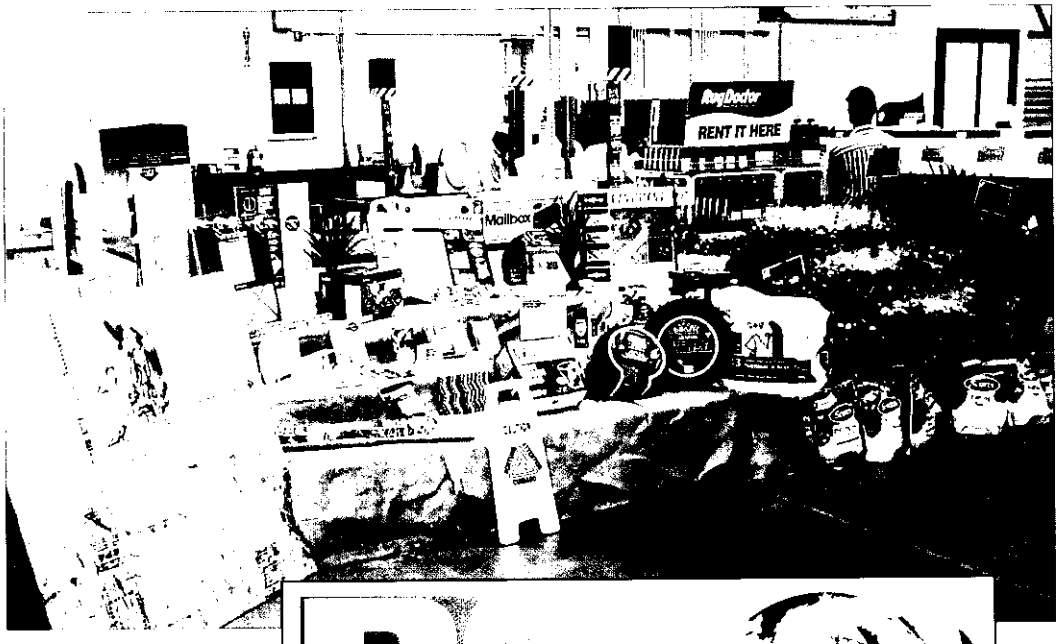


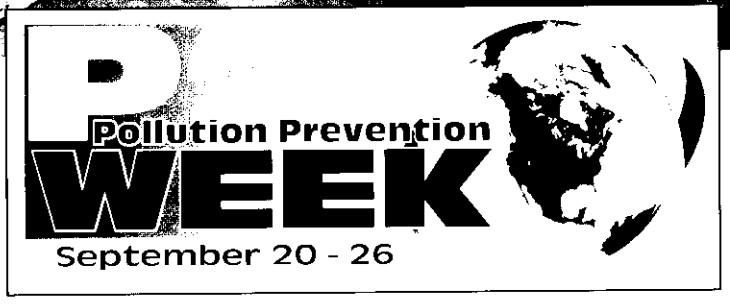
POLLUTION PREVENTION WEEK

Hanford contractors partner with the local community to celebrate National Pollution Prevention Week held every year in September. Throughout this week, cities and businesses across the country highlight their pollution prevention and waste reduction achievements, energize current efforts, and create new initiatives.

Here in our own community, the activities include environmental articles, television and radio promotions of Pollution Prevention Week, tours of local landfills and water treatment facilities, and free transit rides.

Local businesses get involved by displaying and focusing recycled material products and environmentally friendly products. All programs focus on enabling individuals to take an active role in caring for their environment at home and at work.





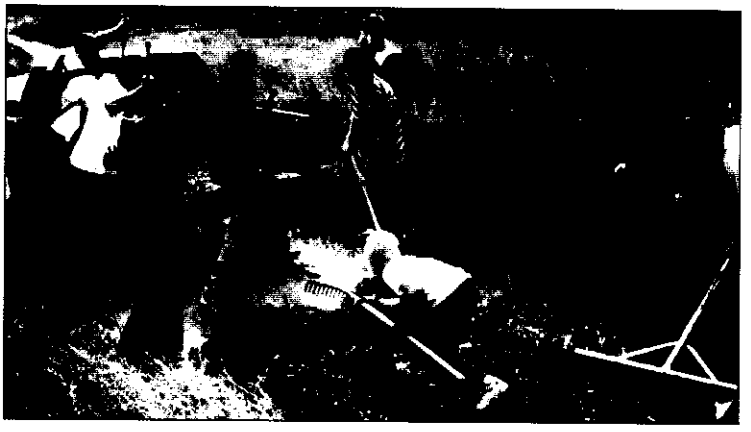
SORBENT OLYMPICS

The "Sorbent Olympics" were hosted by Hanford contractors for the purpose of improving the purchase and use of sorbent products and to provide hands-on exposure to new products normally not used at Hanford. More than 20 vendors displayed their products to management, waste shippers, generators, technicians, health physics technicians, engineers, and scientists.

A list of the sorbent products acceptable for use at Hanford was placed on the Intranet for individuals to become more informed of the best sorbents for their particular application.

CHAMNA NATURAL PRESERVE

A Hanford contractor [illegible] $10,000 to the Tapteal Greenway Association to fund the maintenance and improvement of trails and other restoration work at the Chamna Natural Preserve in Richland. The area had been used for illegal dumping by local citizens and had been seriously degraded by off-road recreational vehicles.



A volunteer team of students spreads bark on a trail in the Chamna Natural Preserve.

Sitewide Assessments

Sitewide Pollution Prevention Opportunity Assessments are conducted on large waste streams or waste streams that cross multiple contractors. A team of individuals assesses the activity or process and evaluates waste minimization opportunities through a cost benefit analysis.

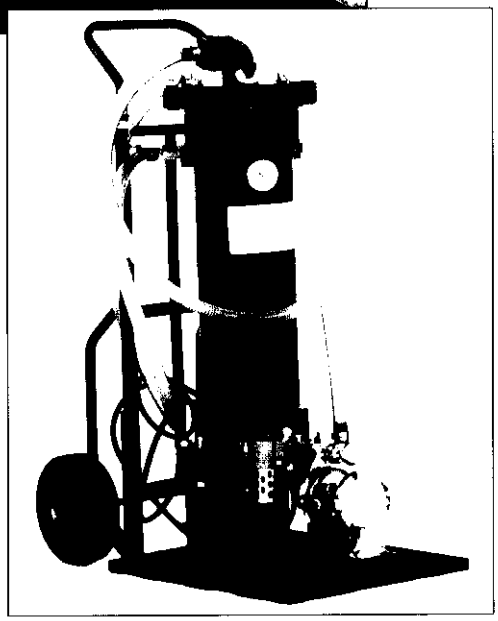
Sitewide Assessment Process:

- Analyze Waste Stream
- Target Crosscutting Areas
- Perform Assessment
- Present to Facility Management and RL
- Prepare ROI
- Implement

Hanford employees pose next to a machining unit.

Coolant Management

An Assessment was conducted at Hanford's Machine Shop. As a result, the useful life of coolant was extended by purchase of a portable filtration unit that filters the sumps during operation. Routine tests are performed and treatment and filtration are prescribed on the basis of the tests.



The portable filtration system for removing suspended solids.

Year 2000 Outlook

To reach the ultimate goal of sustainable development, we will have to do even more. The key to success will be employee innovation applied to pollution prevention/waste minimization.

We will

- Continue to incorporate pollution prevention in our planning and operations.
- Conserve resources and minimize waste.
- Develop innovative technologies to prevent pollutants and minimize wastes.
- Educate the public and our employees on pollution prevention practices.
- Extend partnerships with industry, academia, and other government agencies.
- Measure pollution prevention progress against DOE goals.
- Focus attention on combining pollution prevention/energy efficiency for added value.
- Continually assess our program's effectiveness to improve efficiency and identify areas for pollution prevention.

In the future, Hanford expects to have even stronger environmental stewardship. We will continue to focus on new solutions for waste and pollution. Our most important customers are the future generations, to whom we wish to leave a more prosperous and secure world. Hanford will be a leader in improving the quality of the environment for future generations. Pollution prevention will take us into the future.

And we're looking forward to it!

Individual Accomplishments Summary

Anna Beard
RL P2/WMin Program Manager
Office of Site Services

DOE-RL is committed to achieving high standards of environmental protection and providing a safe and healthful workplace for our employees, contractors, and communities. DOE-RL is committed to conserving natural resources and reducing the environmental burden of waste generation and emissions to the air, water and land. DOE-RL will strive to be leaders in pollution prevention and will ensure that any wastes remaining are properly disposed of in a safe and environmentally sound manner.

The Hanford Site Annual Accomplishment Books have documented over $156 million in cost savings/avoidances on 276 pollution prevention/waste minimization (P2/WMin) successes over the last five years. Although many ongoing projects continue to realize waste reduction and cost savings, the Hanford Site Pollution Prevention Progress Report highlights 46 successes achieved during fiscal year 1999. These successes generated cost savings/ avoidances of over $49 million.

- *Over 64,000 cubic meters low-level waste*
- *Over 800 cubic meters mixed waste*
- *Over 95 metric tons hazardous waste*
- *Over 2,250 metric tons sanitary waste*
- *Over 3,000,000 kilowatt hours energy*

The waste reduction efforts identified in this report have come from formal processes such as Pollution Prevention Opportunity Assessments and from ideas generated by individuals. The High Return on Investment funding provided by the DOE, Headquarters Office of Pollution Prevention, continues to greatly enhance waste reduction efforts at Hanford.

The successful integration of P2/WMin into these and other activities at Hanford have minimized the impact of operations on the environment, reduced waste, and reduced current and future operating costs.

Individual Accomplishments

Below-Grade Structures Released

Below-grade structures outside of the C Reactor Safety Storage structure were found to have low levels of contamination that required concrete and soil to be disposed of as low-level waste.

By using radiological release software, most of the below-grade structures were released to cleanup standards.

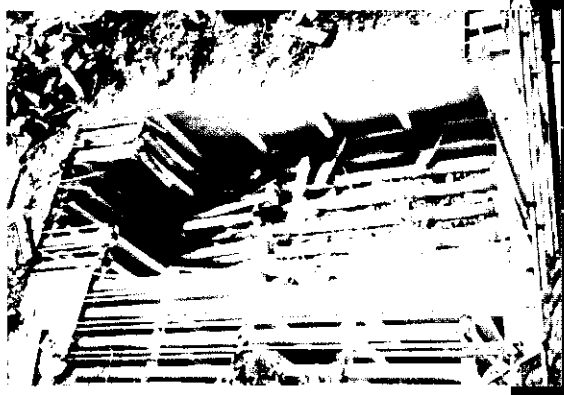
All of the structures that met cleanup standards were released, resulting in a waste avoidance of both concrete and soil.

LLW

5,805 m³

$3,500,000

Allen Palmquist and Douglas DuVon
Bechtel Hanford, Inc.



Most below-grade structures were released to cleanup standards.

Trench Capacity Increased by 300%

Low-level waste was stored in high integrity containers, tripling waste volumes. The containers were designed to stabilize and store waste in wet environments, an unnecessary measure for an arid area.

Found an alternative to save space.

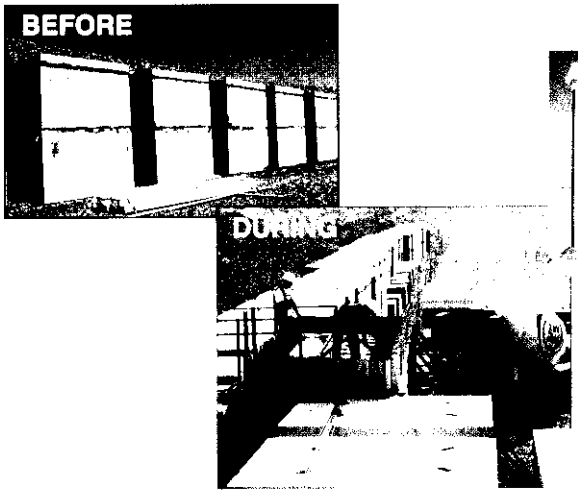
Hanford eliminated the use of the containers and developed a new stabilization method that used a special concrete formulation to stabilize and store the low-level waste. Use of this method decreased the waste associated with overpacking, correspondingly increasing the storage space in the burial trenches.

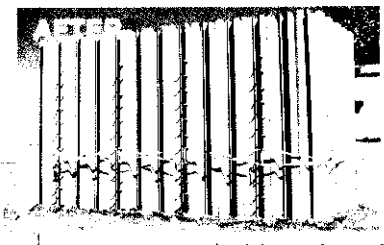
LLW

1,300 m^3

$3,290,000

Dean Pratt and Rick Rosser
Waste Management Federal Services of Hanford, Inc.





What took 70 m^3 of disposal trench space now fits into only 17.5 m^3.

Additional Clean Soil Found

CHALLENGE: Clean overburden (clean soil over contaminated soil) was estimated to be 4,700 m^3 in the 116 B and C remedial action sites.

INITIATIVE: With the use of newly obtained return-on-investment funded detection instruments (hand-held gamma spectrometer and survey instrument), an increase in the baseline estimate of clean overburden was determined.

SUCCESS: The amount of clean overburden was found to measure an additional 7,000 m^3, eliminating soil from disposal as low-level waste.

Waste Type: **LLW**

Quantity Reduction: **7,000 m^3**

One-Time Savings: **$628,200**

CONTRIBUTORS:

Alvin Langstaff
Bechtel Hanford, Inc.

The overburden would have been disposed of as low-level waste.

Plastic Saves Scaffolding from Becoming Contaminated

CHALLENGE A subcontractor working at the 105-C Interim Safe Storage Project was using scaffolding and wanted to protect it from radiological contamination.

INITIATIVE Plastic sheeting was used to wrap the scaffolding before erecting it in radiologically controlled areas.

SUCCESS The plastic proved successful in protecting the scaffolding from contamination, allowing further use in other non-radiologically controlled areas.

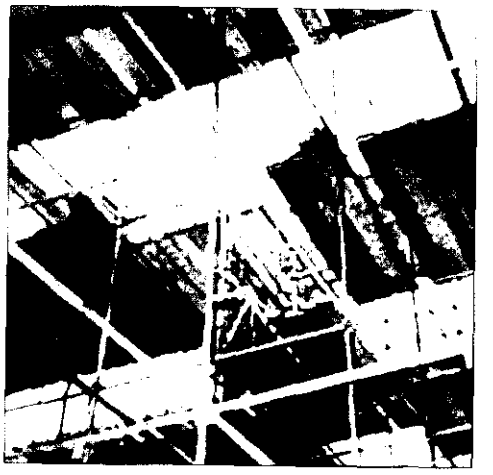
Waste Type: **LLW**

Amount Currently Recycled: **27 m³**

Amount Cost Savings: **$74,000**

CONTRIBUTORS

Patty Newman and Douglas DuVon
Bechtel Hanford, Inc.



Scaffolding such as this was wrapped in plastic.

Crane Released for Public Sale

Crane #17T-19959 had been used in support of Tank Farm operations, Burial Grounds, and minor construction. The crane became contaminated during these activities and was scheduled for burial as low-level waste.

The crane was decontaminated and released for public sale.

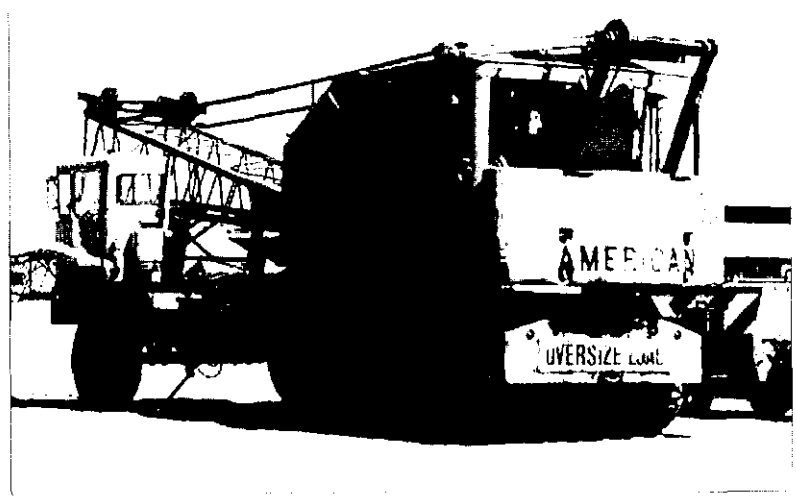
The crane was steam cleaned and is now the first of eight cranes to be decontaminated for public sale.

LLW

37.65 m^3

$35,000

Deanna Klages, Charles "Bud" Evans, and Brad Roach
DynCorp Tri-Cities Services, Inc.



The "American" is the first crane to be released for public sale.

Radioactive Wastewater Now Reusable

Contaminated water was collected in the 105-C Lift Station.

The water was pumped from the Lift Station and processed at the 200 Area Effluent Treatment Facility.

Once treated, the water was free of contamination.

LLW

946 m^3

$166,200

Allen Palmquist and Douglas DuVon
Bechtel Hanford, Inc.

Tanker trucks accepting the waste water from Lift Station.

Gas Chromatography Method Eliminates Low-Level Waste

CHALLENGE: Using a radiological counting method to study plasma protein binding produced low-level waste. A method to eliminate this waste needed to be found.

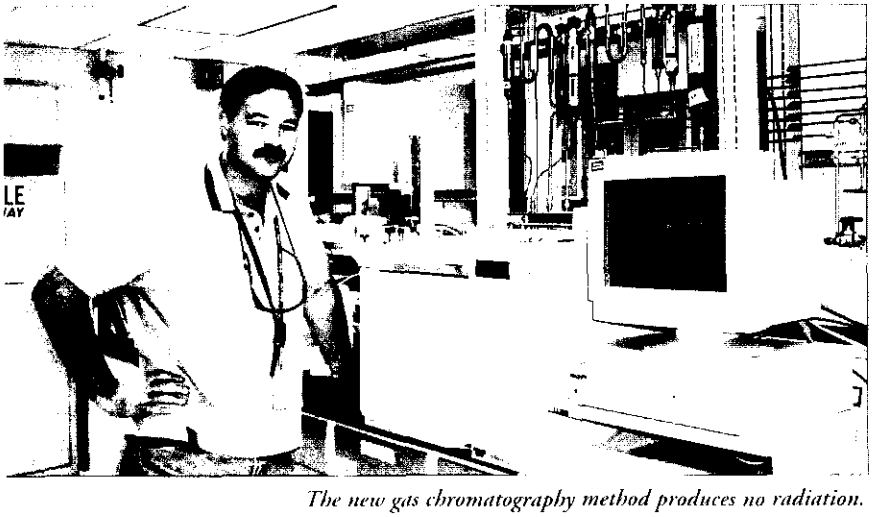
INITIATIVE: A gas chromatography method for studying plasma protein binding was developed to replace the radiological counting method.

SUCCESS: The new method eliminated low-level waste, the need for a radiation work area, a radiation waste disposal area, and the need for a Radiation Control Technician to be on call. The gas chromatography method also reduced the sample size from 3.0 milliliters to 0.250 milliliters. The method was also used to replace various biological tissue binding assays.

Waste Type: **LLW**

Annual Quantity Reduced: **0.62 m^3**

Annual Cost Savings: **$15,000**



The new gas chromatography method produces no radiation.

CONTRIBUTORS:

Karl Weitz
Pacific Northwest National Laboratory

Clarifiers Avoid Disposal

CHALLENGE: Two radiologically contaminated soil wash clarifiers, used to separate solids from process water, were identified for disposal after the completion of the 100-D Soil Wash Pilot Project.

INITIATIVE: The soil wash clarifiers were decontaminated and sold to an offsite vendor.

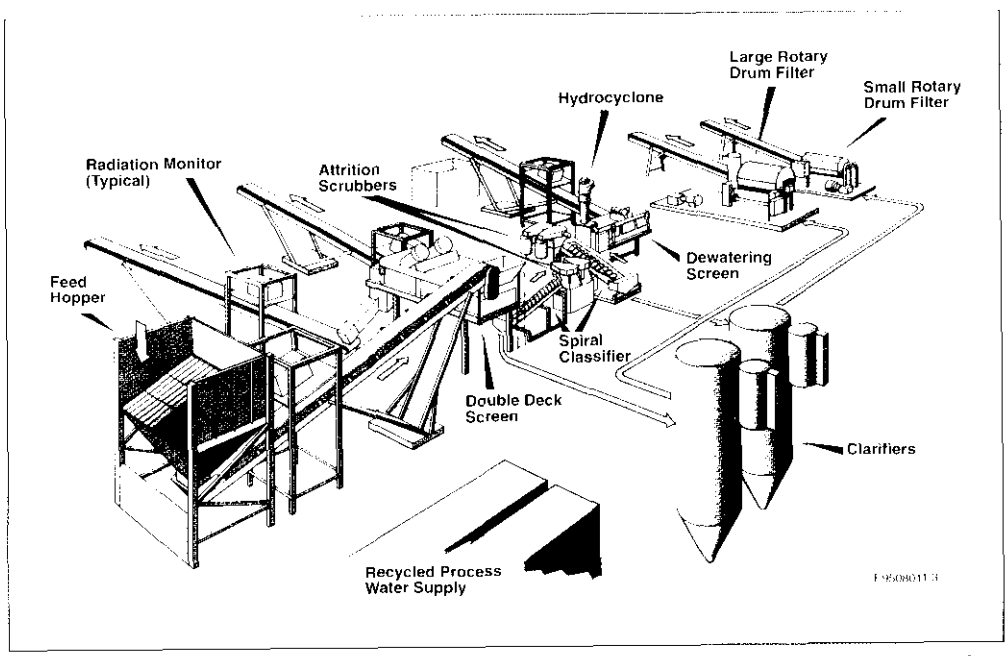
SUCCESS: Redeployment avoided disposal of the clarifiers as low-level waste.

Waste Type **LLW**

Cubic Meters Reduction **73 m³**

Cost Savings **$1,200**

CONTRIBUTORS: John April
Bechtel Hanford, Inc.



The two soil wash clarifiers identified for disposal from the 100-D Soil Wash Pilot Project were instead decontaminated and sold to an offsite vendor.

Geomembrane Liner Installed

The 1300-N Emergency Dump Basin was originally designed to receive emergency cooling water from the N Reactor. Deactivation of the basin meant the carbon-steel liner originally installed would be left contaminated and rainwater would collect, in turn becoming contaminated. The water then would need to be disposed of as low-level waste.

Found a way to avoid disposal of the rain water collecting in the basin.

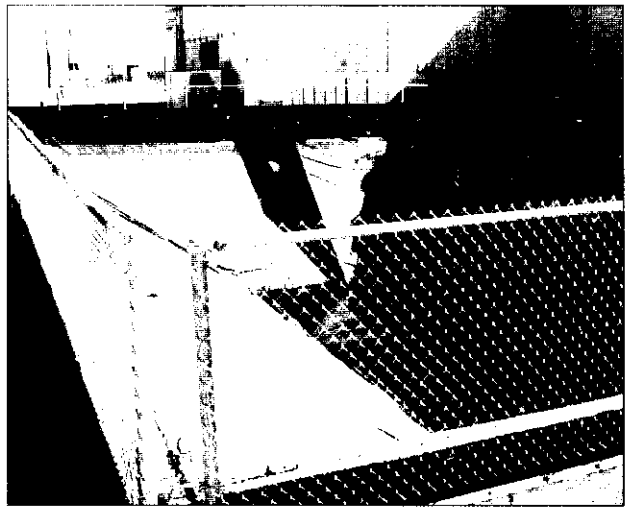
By installing a geomembrane liner in the basin, rainwater that collected was left uncontaminated.

LLW

53.26 m^3

$3,500

Christopher Kemp
and Douglas DuVon
Bechtel Hanford, Inc.



The geomembrane liner saves rainwater from being contaminated.

Concrete Block Rubble Reused as Backfill

Concrete block rubble from the demolition of the 108-F Biological Laboratory was targeted for disposal as low-level waste.

Approximately 105 yd^3 of potentially contaminated concrete block rubble generated from the demolition of the 108-F Biological Laboratory was reused as clean backfill. Through a joint effort between U.S.-EPA, DOE-RL, and the Environmental Restoration Contractor (ERC), the project was able to demonstrate that the rubble was free of contamination, allowing it to be reused. The rubble was transported to the 100B/C Remedial Action Site where it was used to fill in areas where contaminated soil had been excavated during cleanup.

The concrete rubble was transported to the 100B and C sites where it was used to fill in areas where contaminated soil was excavated during cleanup.

The concrete block was reused rather than disposed of as low-level waste.

LLW

166 m^3

$2,600

Dick Day
Bechtel Hanford, Inc.

Number of Waste Sites Decreased

Four hundred and seventeen waste sites at the 300-FF-2 Operable Unit had been identified as needing remedial action.

The sites were re-evaluated following the waste site reclassification process as described in the Tri-Party Agreement.

The process resulted in reclassification of a substantial percentage of the waste sites (three hundred and forty-eight waste sites) as not needing any further action.

LLW

48,624 m^3

$36,300,000

Linda Dietz
Bechtel Hanford, Inc.
Larry Hulstrom
CH2M Hill Hanford, Inc.

An aerial shot of the 300-FF-2 Operable Unit. Most of the waste sites were reclassified as not needing further remedial action.

Crane Oil Change-Outs Reduced

Facilities and Operations changed the oil on certain cranes annually, even though the total operation time of the cranes may have been minimal.

Facilities and Operations installed time meters on eleven cranes to measure the actual hours of operation.

The crane oil is now changed on the basis of operating hours instead of calendar days. Rather than change the oil annually, Facilities and Operations estimate they will have to change the oil only every 10 years.

MLLW

0.065 m^3

$11,600

Ron Underhill and Al Minton
Pacific Northwest National Laboratory

Time meters are installed to measure operating hours of the crane in the background.

PUREX Tunnel Locomotive Battery Recycle

The 30-ton railroad locomotive, "Little Toot," was used to push rail cars with failed equipment into the PUREX burial tunnels, an airborne radioactivity area. The lead/acid batteries used to power the locomotive thus were shipped out as mixed waste at the end of their five-year life cycle.

The four fork-lift type batteries were surveyed for contamination and found to be clean, allowing them to be free-released to an offsite vendor for recycling.

The overall life-cycle disposal costs were reduced.

MLLW

8 m^3

$389,900

Robert (Bob) Moe, Dale Sumsion, and Dan Richardson
FASTER Services Team
Babcock and Wilcox Hanford Company

The battery removal process for Little Toot.

Redesign of Soil Test Reduces Mixed Low-Level Waste

[illegible] A project designed to study the in situ oxidation of trichloroethylene from mixed low-level radioactively contaminated soils required a large column size and a high number of sample tests. The original design required 100 tests using a 4-inch diameter column and 6 kilograms of soil per test.

[illegible] The process for soil testing was redesigned.

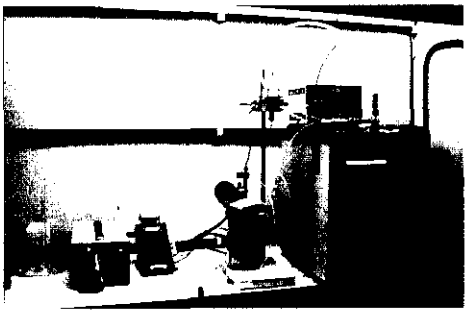
[illegible] The new process reduced the sample size and the number of tests; the majority of which were performed using fewer than 150 grams of soil per sample. The operational simplicity, reduced waste, and lower cost also allowed more parameters to be investigated.

MLLW

2.73 m^3

$600,000

Eric Hoppe, Amit Sharma, and Gary Mong
Pacific Northwest National Laboratory



Intermediate scale apparatus.

Leachate Used as Dust Suppressant

CHALLENGE Leachate from precipitation was designated as a listed mixed low-level waste after it came in contact with the same type of listed waste disposed of in a lined disposal cell.

SOLUTION A de-listing petition that allowed the listed waste codes to be removed from the waste was approved by the DOE-RL and U.S.-EPA.

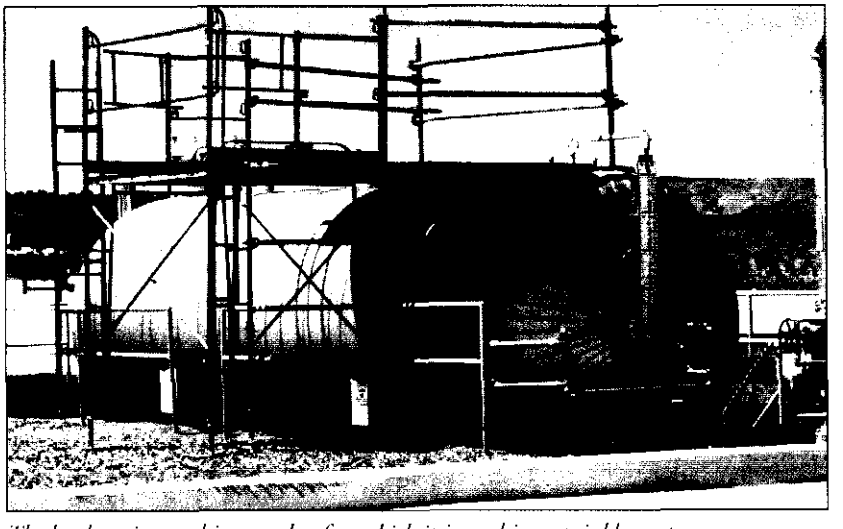
RESULTS The de-listed water is used in a sprinkler system and sprayed over the trench to control dust.

MLLW

779.4 m^3

$130,000

Mike Casbon and Fred Roeck
Bechtel Hanford, Inc.



The leachate is stored in a tank, after which it is used in a sprinkler system as dust suppression.

Sluicing Saves Water

CHALLENGE Tank C-106 had much sludge, or radioactive waste, that was acting as an insulator to the tank's already heat-producing contents. To control the high temperatures emanating from the tank, thousands of gallons of cooling water were added monthly.

INNOVATION Identified a way to decrease the heat emitted from the tank so the amount of water being added monthly could be either decreased or eliminated.

SUCCESS Removal of two-thirds of the sludge resulted in a substantial decrease in the heat the tank had been emitting and consequently eliminated the need for any cooling water to be added to the tank.

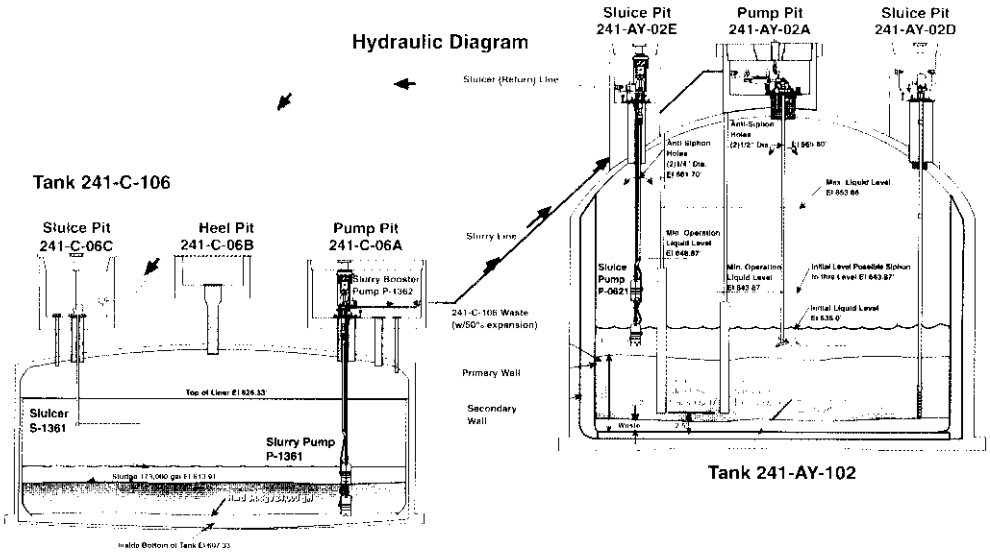
MLLW

20 m³

$25,000

CONTRIBUTOR

John W. Bailey
Numatec Hanford



HAZARDOUS WASTE

Crane Oil Change-Outs Reduced

Facilities and Operations changed the oil on certain cranes annually, even though the total operation time of the cranes may have been minimal.

Facilities and Operations installed time meters on eleven cranes to measure the actual hours of operation.

The crane oil is now changed on the basis of operating hours instead of calendar days. Rather than change the oil annually, Facilities and Operations estimate they will have to change the oil only every 10 years.

HAZ

0.058 t

MLLW

$11,600

Ron Underhill and Al Minton
Pacific Northwest National Laboratory

Time meters are installed to measure operating hours of the crane in the background.

Air Conditioners and Heat Pumps Made Available for Reuse

As a result of deactivation and decommissioning (D&D) of the 1705-N facility, nine air conditioners and heat pumps were identified as needing freon removed for disposal as hazardous waste.

The air conditioners and heat pumps were left with the freon intact and stored in a warehouse for redistribution.

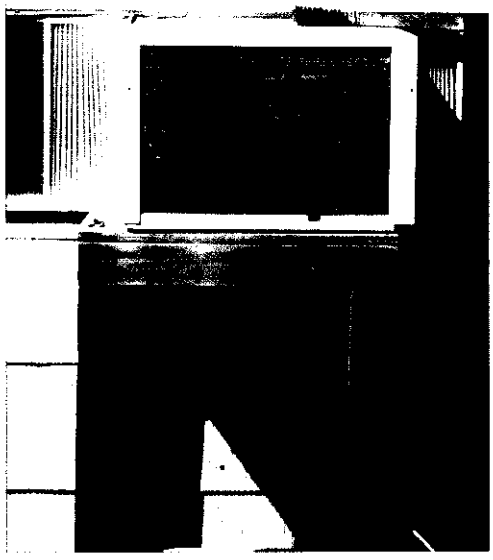
The air conditioners and heat pumps were redistributed on site and the generation of hazardous waste was avoided.

HAZ

0.30 t

$6,500

Donald Eckert
Bechtel Hanford, Inc.



This air conditioner is now keeping someone cool.

Methanol/Acetic Acid Reused

The Molecular Biosciences Department uses a mixture of methanol, acetic acid, and Coomassie blue dye, a hazardous chemical, as a stain to detect proteins. Because of contamination from the dye, the mixture had to be disposed of each time it was used.

Activated carbon was used to strip out the dye.

With the dye stripped out, the department can now re-spike the clean methanol/acetic acid with dye and reuse it.

HAZ

0.06 t

$2,400

Blue dye being stripped out to produce a reusable methanol/acetic acid that can be re-spiked with dye and used again.

Lye Meng Markillie and
Susan Varnum
Pacific Northwest National Laboratory

Light-Emitting Diode Modules Replace Incandescent Bulbs

Because of a high failure rate and frequency of replacement (quarterly), an acceptable substitute needed to be found for the 60-watt incandescent bulbs used in the corridors to inform staff of laser use inside lab spaces.

The incandescent bulbs were replaced with 1.8-watt light-emitting diode (LED) modules.

The LED modules will pay for themselves within 1.5 years.

HAZ

0.0025 t

$1,800

An incandescent light bulb being replaced with a light-emitting diode module.

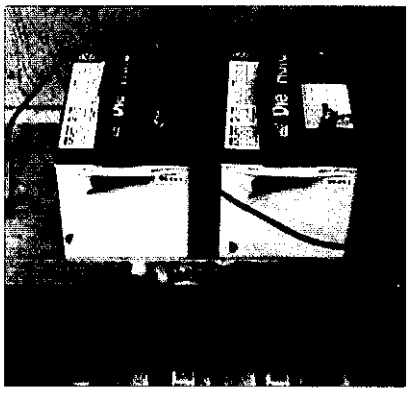
Melvin L. Owen and
Walter D. Pendergraft
Pacific Northwest National Laboratory

Marine Batteries Reused

Six new marine batteries did not have a use at their current facility and were about to be disposed of as hazardous waste. The batteries originally were purchased as backup batteries for a diesel system that, when redesigned, eliminated the need for the backup batteries.

A chemical stockroom advertised the batteries via electronic mail and through environmental compliance representatives.

The batteries found a home off site at the Marine Sciences Laboratory in the Puget Sound area.



The batteries are being used in the Puget Sound area.

HAZ

0.07 t

$2,600

CONTRIBUTORS

Mindy Spohr, Brian Gruendell, Mike Stephenson, Mark Riess, and Elizabeth Raney

Pacific Northwest National Laboratory

High-Efficiency Nebulizer Reduces Hazardous Waste

CHALLENGE: The conventional method for the nebulization of acid solutions for inductively coupled plasma/optical emission spectroscopy analysis results in an uptake of approximately 2.5 mL/min, only 3-5% of which is actually used for analysis with the remainder being disposed of as hazardous waste.

INITIATIVE: A high-efficiency nebulizer was purchased.

SUCCESS: The high-efficiency nebulizer reduced the generation of hazardous waste by 20 times and reduced purchasing and labor costs.

HAZ

0.06 t

$3,700

CONTRIBUTORS:

May-Lin Thomas and Karl Pool
Pacific Northwest National Laboratory

Checking readouts from a high-efficiency nebulizer.

Chemicals Reused

Varous chemicals are used in the course of research. They may be left over at the end of a project or whenever a process is changed that reduces or eliminates the use of a particular chemical.

A system was established in which the chemicals were reused.

The Chemical Redistribution Center facilitates the exchange of chemicals. Staff place their excess chemicals in the Center. Before purchasing new chemicals, researchers contact the center to see whether the chemical needed was available, saving on both disposal costs and costs of new chemicals.

HAZ

0.068 t

$2,500

Judith M. Johannesen and Ryan O. Lokken
Pacific Northwest National Laboratory

Researchers search for excessed chemicals.

Microdigestion Reduces Hazardous Waste

CHALLENGE To analyze for metals, researchers at the Marine Sciences Laboratory placed 0.5 grams of tissue and sediment samples in 5-10 milliliters of concentrated acid and then diluted that to 20 milliliters of solution. After metals analysis, 18 milliliters of hazardous waste per digestion were left for disposal.

INITIATIVE The researchers tested several different microdigestion methods for use with inductively coupled plasma/mass spectroscopy metals analysis and cold vapor atomic absorption mercury analysis. They found that microdigestion works for most metals.

The microdigestion method reduces the generation of hazardous waste.

SUCCESS Microdigestion reduced the hazardous waste by approximately 90%.

HAZ

0.23 t

$13,600

CONTRIBUTORS

Linda Bingler and Eric Crecelius
Pacific Northwest National Laboratory

Size-Exclusion Chromatography Reduces Hazardous Waste

Synthetic DNA and proteins were purified by reverse-phase chromatography, using solutions that contained acetonitrile. Scientists wanted to find a way to avoid the use of hazardous chemicals in the purification processes.

New gel filtration and ion exchange columns were purchased; these use either water or non-hazardous buffer and salt solutions to flush materials through the column.

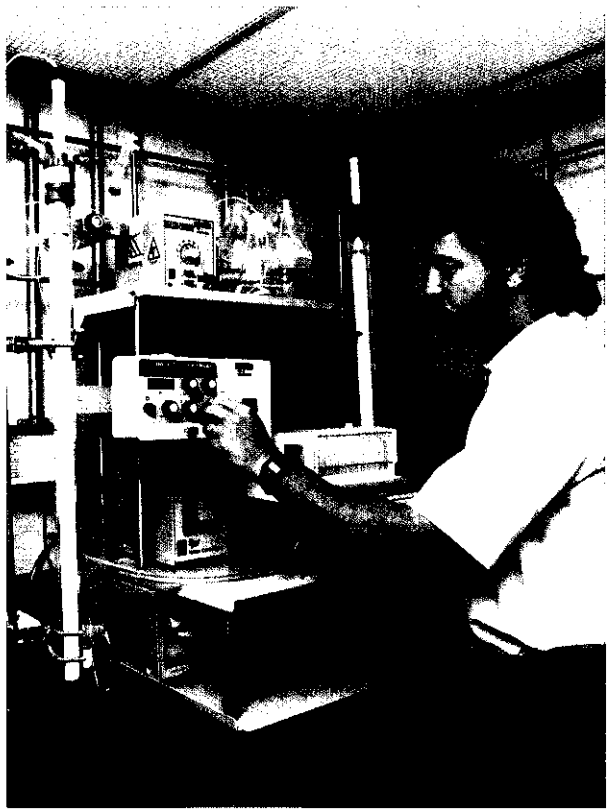
The new size-exclusion chromatography method eliminates 300 liters of hazardous waste per year and reduces purchasing and labor costs.

HAZ

0.16 t

$23,200

Michael Kennedy and
Nancy Isern
Pacific Northwest National Laboratory



The new size-exclusion chromatography method.

Dow X21 Resin Regenerated

Dow X21 resin, used in ion exchange columns at various pump and treat units on site to remove contaminates from ground water, was disposed of after change out.

The resin was sent off site and regenerated.

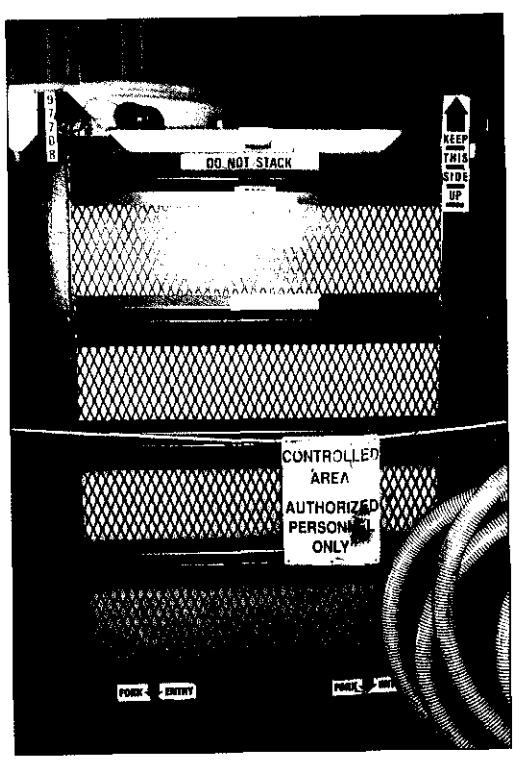
The resin was recycled so that it can be reused many times before disposal.

HAZ

25.6 t

$330,600

Mark Buckmaster
Bechtel Hanford, Inc.



The Dow X21 Resin is stored in containers awaiting shipment off site for regeneration.

Sulfuric Acid Reused

PROBLEM Four drums of 93% sulfuric acid were identified as unneeded.

INITIATIVE A use was found for the acid on site.

SOLUTION The sulfuric acid was used as a pH stabilizer in two pump-and-treat units.

HAZ

1t

$11,700

CONTRIBUTOR

Russ Fabre
Bechtel Hanford, Inc.

These two drums of sulfuric acid are currently in use.

Granular Activated Carbon Regenerated

CHALLENGE Granular activated carbon (GAC) used in air-stripping technology and vapor extraction systems (groundwater and soil remediation systems) collected volatile organic compounds, primarily carbon tetrachloride, considered Resource Conservation and Recovery Act (RCRA) hazardous waste.

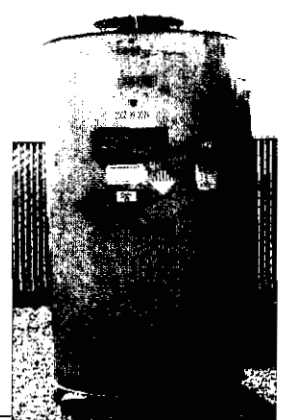
INITIATIVE Once saturated with volatile organic compounds, the GAC was sent off site to be regenerated rather than disposed of, after which it was returned and reused.

SUCCESS The GAC has been regenerated up to four times. This process significantly reduced the quantity of hazardous waste generated and reduced the dollar amount spent on new GAC.

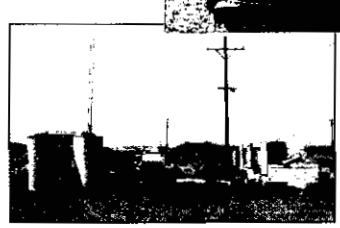
HAZ

8.2 t

$93,440



Used GAC canister.



Groundwater remediation system.

Soil remediation system.

GAC, once used in soil and groundwater remediation systems, is sent off site to be regenerated.

CONTRIBUTORS

Mark Buckmaster
Bechtel Hanford, Inc.

Fuel Cell Processor Project Reuses Gasoline It Generates

A research project for the U.S. DOE's Office of Transportation Technology vaporized gasoline.

The researchers re-condensed the vaporized gasoline.

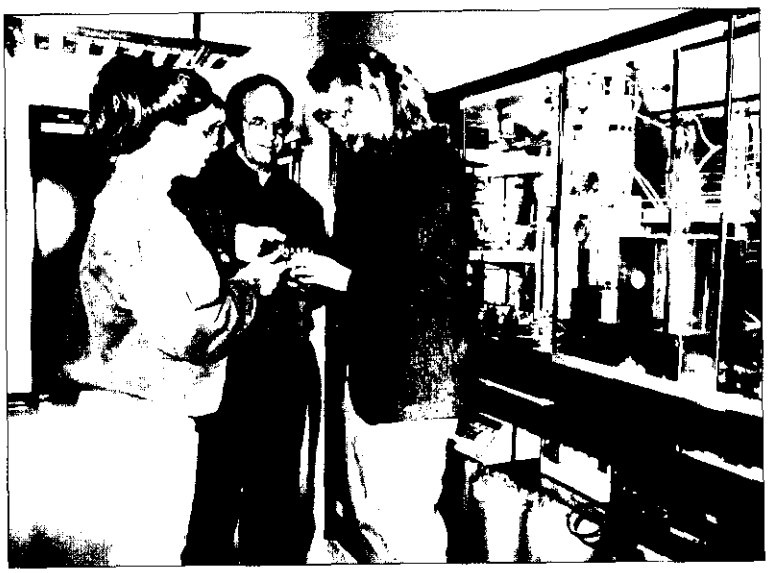
Small quantities of re-condensed gasoline (23 gallons) were used in grounds-keeping equipment. When the project re-condensed larger quantities (250 gallons), researchers redesigned the process to reuse the gasoline within the research project.

HAZ

0.83 t

$26,500

Jennifer Marco, Annalee Tonkovich, and Gary Roberts
Pacific Northwest National Laboratory



Microchannel gasoline vaporizer being prepared for testing.

Office Supplies Reused

CHALLENGE During downsizing, staff stored excess office supplies in cabinets for reuse. However, tight budgets eventually forced many organizations to give up this storage space, leaving no place to store excess office supplies.

SOLUTION Available office supplies were advertised, both in house and across the DOE-RL complex. For supplies still in excess after the advertising, such as binders, a contest was held to determine the largest quantity and most creative reuse. Staff who found a reuse for five binders were awarded a box of pansies as they were removed from the flower beds.

SUCCESS Numerous supplies were reused, saving money by avoiding the purchase of new products.

SAN

0.4 t

$8,500

CONTRIBUTORS:

Pollution Prevention Team, Jo Lynn Draper, Judy Kophs, Linda Page, and Teresa Schlotman
Pacific Northwest National Laboratory

Office supplies being rescued.

Mobile Exhauster Finds Use Onsite

A 9,000 ft^3/min mobile exhauster had been ordered for use in a project in the 200 East Area. When the project was cancelled, the exhauster was left unused.

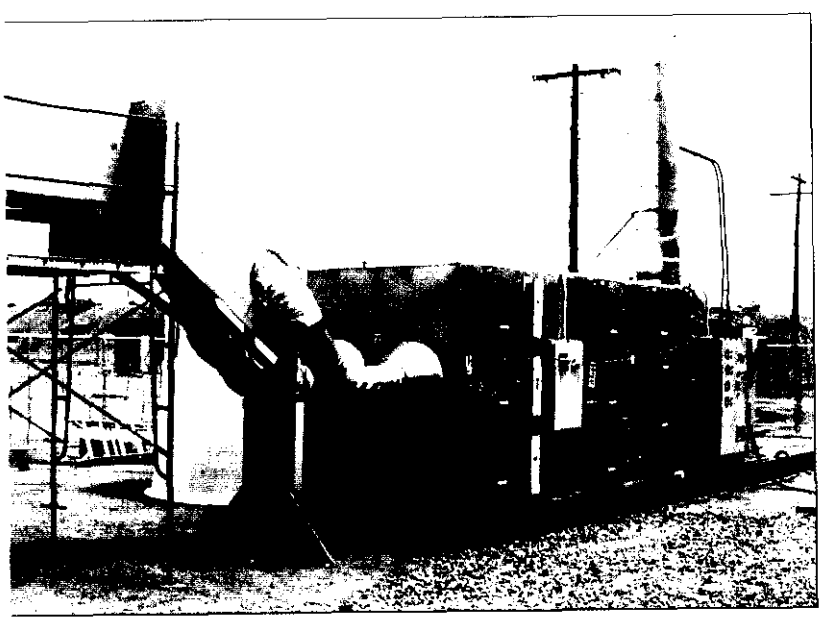
A use was found for the exhauster.

The mobile exhauster was moved to the 105-C Interim Safe Storage Project to be used as a building exhauster. From there, it was sent to 233-S to be used as a backup exhauster.

SAN

12 t

$200,000



Paul Griffin and Allen Palmquist
Bechtel Hanford, Inc.

The exhauster serves as a backup at 233-S.

Gantry Crane Finds New Use

CHALLENGE: A 110-ton Gantry crane at N Reactor, for maintaining raw water pumps and unloading barges, was not being used.

INITIATIVE: A use was found for the surplus crane.

SUCCESS: The surplus crane was transferred to a local company, Gunderson Northwest, which rebuilds railroad cars. There, it has increased output and jobs by 25%.

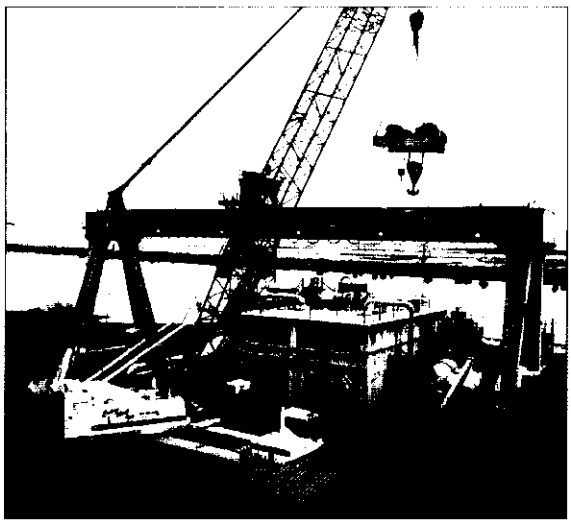
Waste Type: **SAN**

One Time Disposal Cost: **99 t**

One Time Savings: **$450,900**

CONTRIBUTORS:

Douglas DuVon and Don Eckert
Bechtel Hanford, Inc.



The crane being dismantled for transfer to Gunderson Northwest.

Concrete Used as Backfill

Concrete from the demolished structures at the 105-C Reactor was usually disposed of as demolition waste. Many of the below-grade structures from the 105-C Project needed backfill once released.

The concrete was released for use as backfill in the below-grade structures that were found clean at the 105-C Interim Safe Storage Project.

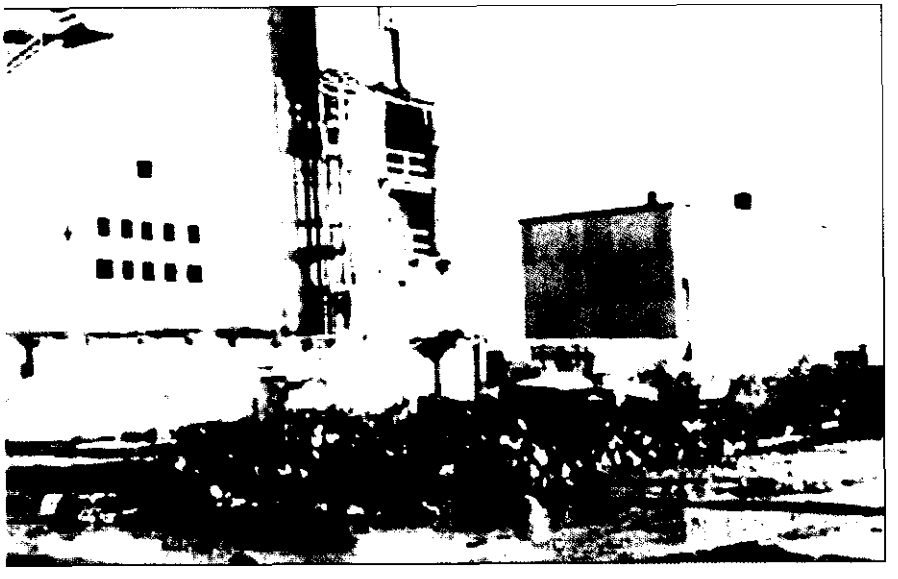
The concrete was reused rather than disposed of as sanitary waste.

SAN

3,810 t

$504,000

Allen Palmquist and Douglas DuVon
Bechtel Hanford, Inc.



Concrete was released and used as backfill in the below-grade structures.

Liners Find a Home

CHALLENGE Nearly two hundred 90-mil drum liners were identified as no longer being needed.

INITIATIVE The liners were advertised throughout the Site.

SUCCESS Rather than being excessed and sold off site, various Hanford Site generators expressed interest in them and received the liners.

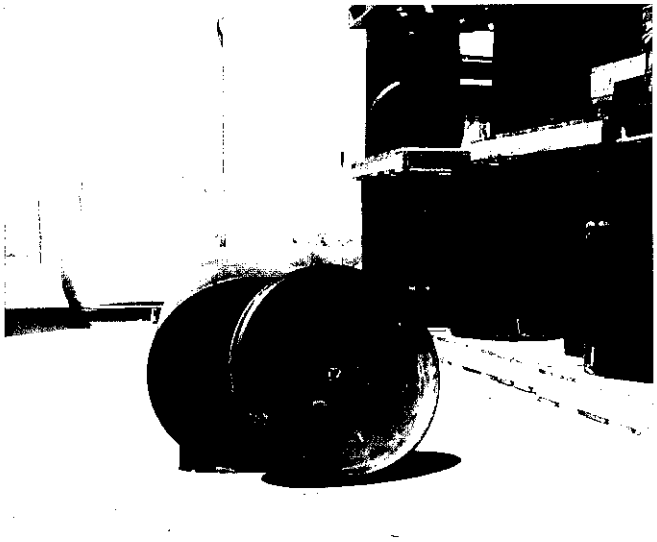
SAN

1.93 t

$8,800

CONTRIBUTORS

Douglas DuVon and Brad Schilperoort
Bechtel Hanford, Inc.



This liner is ready for reuse at T-Plant.

Micron Filters Reclaimed

[redacted] Twenty-eight unused micron filters were left over from the N Basin cleanout project. The extra filters were identified for excess.

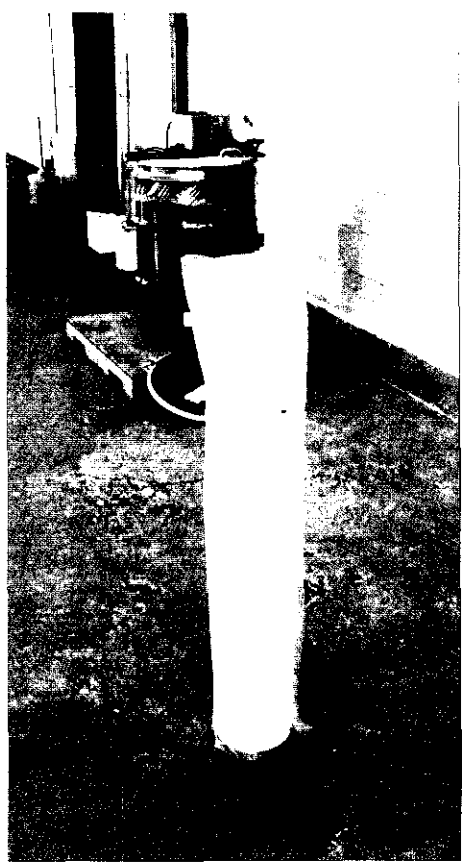
[redacted] The filters were reclaimed from excess to be used in pumping operations at the 200 Area Effluent Treatment Facility.

[redacted] The new and unused filters were saved from excessing, and the facility realized a dollar savings by reducing new filter orders.

SAN

0.7 t

$11,500



One of the micron filters saved from being excessed.

[redacted]

Don Eckert and Douglas DuVon
Bechtel Hanford, Inc.

New Uses Found for Obsolete Products

A new use was necessary for slick fax paper and color transparency film. They had become obsolete with the purchase of a new fax machine and color printer.

The rolls of fax paper fit in the electronic white boards in meeting rooms, and the property tracking system was used to find printers that still used the obsolete color transparency film.

Not only was the cost of purchasing these supplies saved as well as disposal costs, but a local motel become aware of the electronic writing boards and contributed its obsolete rolls of slick fax paper.

SAN

0.014 t

$1,000

Elizabeth Raney, Steve Shook, and Linda Walker
Pacific Northwest National Laboratory

David Harker
Walla Walla Comfort Inn

Obsolete color printer transparency film was distributed to those who could use it on site.

Office Supplies Donated

Due to downsizing, a name change, purchase of new copiers, and loss of office space, staff were faced with a glut of used office products (binders, folders, and paper).

After finding a use for as many of the products as possible across the DOE-RL complex, the remainder of the products were donated to local schools, the Children's Center, and World Relief.

Local taxpayers and non-profit organizations saved the cost of providing more than 150 binders, 6,500 folders, and 9,000 lb of art paper to students and those in need.

SAN

4.5 t

$9,800

Royace Aikin, Stan Kophs, Michelle Lamarche, Connie Mitzel-Faulk, and Lisa Schwegel
Pacific Northwest National Laboratory

Preparing folders for transport to Tri-City Schools.

Dow X21 Resin Regenerated

Dow X21 resin, used in ion exchange columns at various pump-and-treat units on site to remove contaminates from ground water was disposed of after change out.

The resin was sent off site and regenerated.

The resin was recycled so that it can be reused many times before disposal.

SAN

5 t

$330,600

Mark Buckmaster
Bechtel Hanford, Inc.

The Dow X21 Resin is stored in containers awaiting shipment off site for regeneration.

Sluicing Saves Water

Tank C-106 had much sludge, or radioactive waste, that was acting as an insulator to the tank's already heat-producing contents. To control the high temperatures emanating from the tank, thousands of gallons of cooling water were added monthly.

Identified a way to decrease the heat emitted from the tank so the amount of water being added monthly could either be decreased or eliminated.

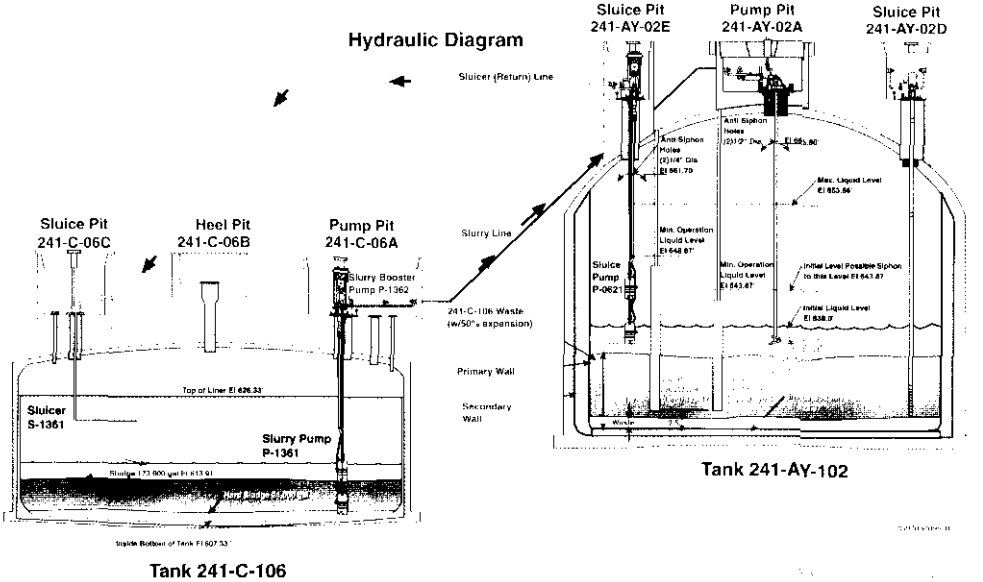
Removal of two-thirds of the sludge resulted in a substantial decrease in the heat the tank had been emitting and consequently eliminated the need for any cooling water to be added to the tank.

SAN

250 t

$25,000

John W. Bailey
Numatec Hanford



RL Sells Equipment to New Burbank Firm

CHALLENGE: Westway Feed Products, a molasses-based cattle feed firm, was moving into the Port of Walla Walla and needed tanks and other supplies to establish itself and begin work. DOE had excess tanks and equipment available for reuse.

INITIATIVE: RL sold the tanks and other equipment, such as pumps, motors, valves, and a truck and rail loading station, to Westway, which resulted in savings for both DOE-RL and Westway.

SUCCESS: By selling the tanks, a large portion of what would have been waste was instead recycled.

Waste Type: **SAN**

One-Time Benefit: **44 t**

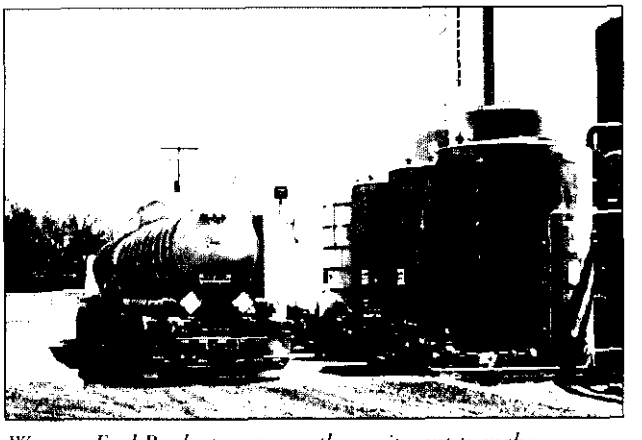
One-Time Savings: **$52,000**

CONTRIBUTORS:

Jerry Schneider
Fluor Daniel Hanford, Inc.

Ray Baker
Westway Feed Products, Burbank, WA

Nancy Sitton
DynCorp Tri-Cities Services, Inc.



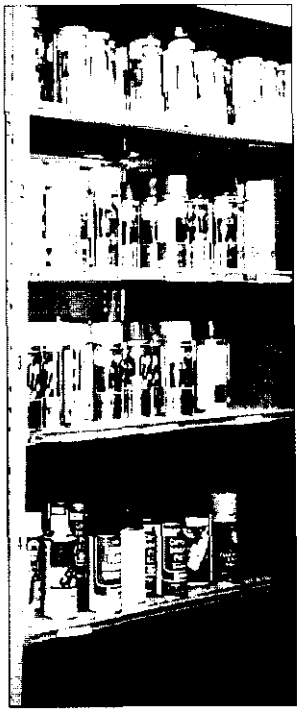
Westway Feed Products now uses the equipment to make molasses-based feed for cattle throughout the Northwest.

Centralized Consolidated Recycle Center

RESOURCES Resources such as fluorescent tubes, DOP ballasts, aerosol, batteries, shop towels, and incandescent, sodium, and mercury bulbs are recyclable and/or reusable.

ACCOMPLISHMENTS The items listed above, as well as some others, have been recycled through the Centralized Consolidated Recycle Center (CCRC) in FY 1999 and in past years.

SUMMARY The CCRC recycled the following resources from Bechtel Hanford, Inc., Pacific Northwest National Laboratory, and Project Hanford Management Contract:



Aerosol products are among the items the CCRC recycles.

Aerosol products	0.14 t
Incandescent/sodium/mercury lamps	0.88 t
Miscellaneous small batteries	2.64 t
Shop towels	0.76 t
Lead acid/gel cell batteries	33.65 t
Intact and crushed fluorescent tubes	12.18 t
DOP ballasts	1.49 t

TOTAL **51.74 t**

COST **$417,405**

CONTRIBUTORS

Candice Marple
DynCorp Tri-Cities Services, Inc.

Fleet Maintenance Recycles

CHALLENGE Tires, used oil, and vehicle batteries can be reprocessed or recycled.

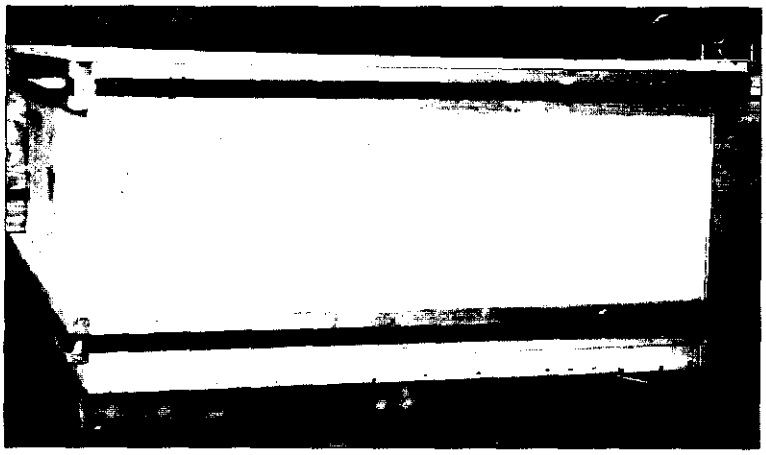
INITIATIVE *Fleet Maintenance collects the products.*

RESULTS In fiscal year 1999 and in past years, Fleet Maintenance recycled these materials from Bechtel Hanford, Inc., Pacific Northwest National Laboratory, and Project Hanford Management Contract:

Used oil	36.51 t
Batteries	10.84 t
Tires	19.55 t
Total Amount	**66.9 t**
Total Savings	**$30,300**

CONTRIBUTORS

Ed Lamm
DynCorp Tri-Cities Services, Inc.



Large lead-acid batteries are recycled through Fleet Maintenance.

Excess Chemicals/Metals and Equipment

CHALLENGE Many chemicals and metals acquired on site either are never used or are left over from finished projects.

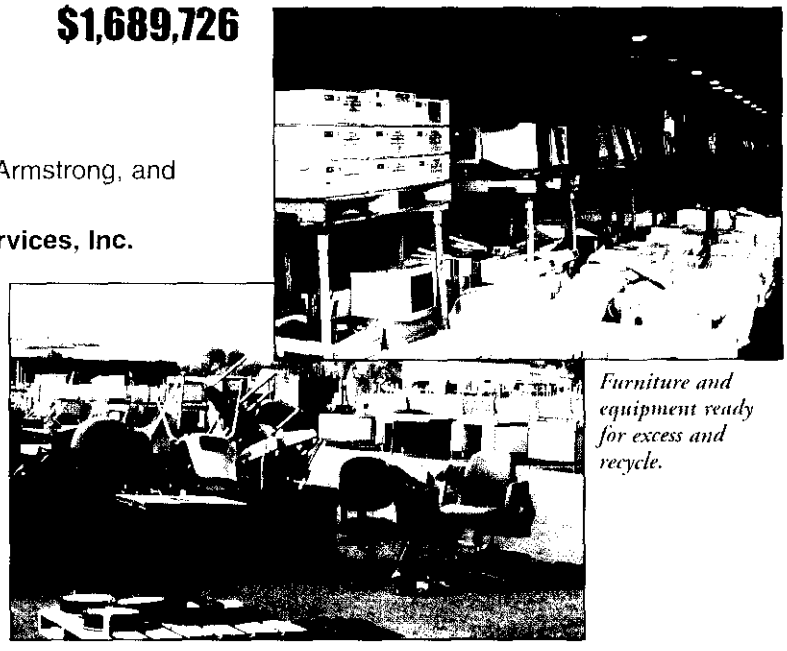
INITIATIVE An excess program was used to recycle these resources both onsite and offsite.

SUCCESS The Excess Program recycled these resources from Bechtel Hanford, Inc., Pacific Northwest National Laboratory, and Project Hanford Management Contract:

Injection molding resin pellet	0.23 t
Upright safety sorbent	0.30 t
Ferrous/non-ferrous metals	319.54 t
Bulk lead	15.60 t
Miscellaneous chemicals	0.10 t
Furniture	25.80 t
Gift program	N/A

361.57 t

$1,689,726



Furniture and equipment ready for excess and recycle.

CONTRIBUTORS

Candice Marple, Dona Armstrong, and Gary Carlson
DynCorp Tri-Cities Services, Inc.

Douglas DuVon
Bechtel Hanford, Inc.

Eric Alderson
Pacific Northwest National Laboratory

Solid Waste Recycle Program

Employees use many recyclable resources. Personnel are encouraged to buy only what is needed and to use up products or recycle/reuse the materials.

The resources were recycled.

Bechtel Hanford, Inc., Pacific Northwest National Laboratory, and Project Hanford Management Contract recycled the following products:

Paper	368.77 t
Cardboard	82.60 t
Newspaper/magazines	47.29 t
Glass	1.10 t
Tin	0.54 t
Plastic	0.66 t
Software	31.58 t
Transparencies	0.42 t
Toner cartridges	47.71 t
Pallets/scrap wood	40.68 t

621.35 t

Paper and toner cartridges ready to be recycled.

$217,100

Kathy Hinkelman
DynCorp Tri-Cities Services, Inc.

Douglas DuVon
Bechtel Hanford, Inc.

Eric Alderson
Pacific Northwest National Laboratory

Materials loaded and ready to recycle.

ENERGY

Light-Emitting Diode Modules Replace Incandescent Bulbs

Because of a high failure rate and frequency of replacement (quarterly), an acceptable substitute needed to be found for the 60-watt incandescent bulbs used in the corridors to inform staff of laser use inside lab spaces.

The incandescent bulbs were replaced with 1.8-watt light-emitting diode (LED) modules.

The LED modules will pay for themselves within 1.5 years.

Energy

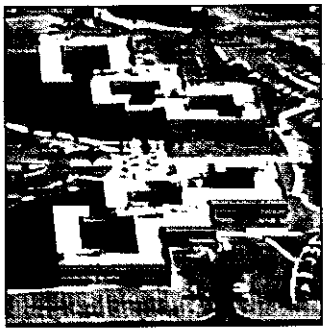
517 kWh

$1,800

Melvin L. Owen and
Walter D. Pendergraft
Pacific Northwest National Laboratory

An incandescent light bulb being replaced with a light-emitting diode module

Building Controls Save Energy and Costs



Both buildings now use less energy.

CHALLENGE: A new office building, instead of using less energy than a similar building as designed, used more. The reason was unknown, and thus the problem could not be mitigated.

SOLUTION: The building management and staff, to identify deficiencies and implement improvments, analyzed previously collected data to verify the difference in energy consumption, established a baseline of energy use, reset the building operating schedules using real time data, repaired equipment, adjusted temperatures, and verified the results.

SUCCESS: The result was a 33% reduction in energy use in the less efficient building and a 36% reduction in energy use in the energy efficient building.

Energy

Quantity Reduced:

>3 million kWh

Annual Savings:

$90,000

CONTRIBUTORS:

Jeff Lettau, Ron Underhill, Darrel Hatley, and Don Hadley

Pacific Northwest National Laboratory

ACRONYMS

BHI	Bechtel Hanford, Inc.
CCRC	Centralized Consolidated Recycle Center
CMS	Chemical Management System
D&D	Decontamination & Decommissioning
D&D/ER	Decontamination & Decommissioning/ Environmental Restoration
DOE-RL	Department of Energy Richland Operations
DOP	Phthalic Acid, bis(2-ethylhexyl) ester
EMS	Environmental Management System
EPA	Environmental Protection Agency
ERC	Environmental Restoration Contract
ES&H	Environmental Safety & Health
EWP	Enhanced Work Planning
GAC	Granular Activated Carbon
ISMS	Integrated Environment, Safety, and Health Management System
LED	Light-Emitting Diode
LLW	Low-Level Waste
LMHC	Lockheed Martin Hanford Corporation
MTHF	Methyletetrahydrofuran
MLLW	Mixed Low-Level Waste
ORP	Office of River Protection
P2/Wmin	Pollution Prevention/Waste Minimization
PHMC	Project Hanford Management Contract
PNNL	Pacific Northwest National Laboratory
PUREX	Plutonium Uranium Extraction Facility
R&D	Research & Development
RCRA	Resource Conservation Recovery Act
RL	Richland Operations Office
ROI	Returnment on Investment
t	Metric Tons
US-EPA	United States Environmental Protection Agency
VPP	Voluntary Protection Program

Pollution Prevention Contacts

Anna Beard, Office of Site Services
P.O. Box 550, S7-55, Richland, WA 99352 (509) 376-7472

Russ Bisping, FDH Pollution Prevention
P.O. Box 1000, H6-06, Richland, WA 99352 (509) 376-5695

Douglas DuVon, BHI Pollution Prevention Program
3350 George Washington Way, H0-02, Richland, WA 99352 (509) 372-9102

Eric Alderson, PNNL Pollution Prevention Program
P.O. Box 999, P7-79, Richland, WA 99352 (509) 373-4233

Pete Segall, WMH Pollution Prevention Program
P.O. Box 700, H6-06, Richland, WA 99352 (509) 372-0469

the team agreed that the report should be as compatible with the environment as possible. To that end, several unique environmental technologies were used in its creation.

were used to eliminate the need for film, film processing and chemicals. Some of the photographs in the book were "reused." The report was printed on a recycled paper that meets EPA guidelines and contains 30-percent post-consumer waste.

The report is also "perfect bound," eliminating staples.

There were 500 copies of this report printed.
The report is available on the Internet at