



1994

HANFORD REVIEW

A LOOK AT WASTE MANAGEMENT AND ENVIRONMENTAL RESTORATION AT HANFORD

Progress on mission marked by change

The Hanford Site's environmental restoration mission has seen plenty of change and evolution since it began in 1989, and 1994 was no exception.

The year began with two visible examples of progress: the signing of a renegotiated Tri-Party Agreement and formation of the Hanford Advisory Board. It ended with concern over whether federal budget cuts will slow the pace of the nation's largest environmental restoration effort, and significantly reduce the workforce that has grown the past few years.

The months in between brought a new look to the 1,450-square-kilometer (560-square-mile) site, where plutonium for the nation's defense program was produced for more than 40 years. The Department of Energy, which owns the site, and its contractors began to build, complete, or restart facilities needed to clean up the many areas within the site's boundaries that are contaminated by chemical or radioactive waste.

Hanford's commitment to public involve-

ment was demonstrated, not only through advisory board meetings but through a return visit by Secretary of Energy Hazel O'Leary and extensive public participation in decisions about the management of spent nuclear fuel stored near the Columbia River.

Important gains were made in the safe management of the radioactive waste storage tanks buried near the center of the site, and progress on deactivating facilities from Hanford's defense production mission continued.

The site completed all of the milestones in the Tri-Party Agreement—the blueprint for bringing Hanford into compliance with environmental laws and regulations—due by year's end.

Work was reorganized into projects and management was streamlined to improve cost-effectiveness and efficiency. Between the hiring of an environmental restoration contractor and the refocusing of other resources, more attention than ever went to cleanup near

the Columbia River.

The Department of Energy's desire to broaden the area's economic base—in preparation for the eventual end of cleanup and the money it brings—and get more for its investment led to an expansion of Hanford's economic transition efforts in 1994. Hanford is partnering with surrounding communities to diversify the region's economy, and committed to help meet national science and technology needs, not just its own.

At year's end, the advances Hanford had made were being overshadowed by fiscal realities. Site managers found themselves looking for ways to drive costs down and improve productivity while meeting Tri-Party Agreement milestones and focusing on the most critical parts of the mission.

The site enters 1995 certain of more changes and evolution. Progress will continue, however, and Hanford's commitment to the region and to environmental cleanup and compliance will not change.

Environmental Contractor comes to Hanford

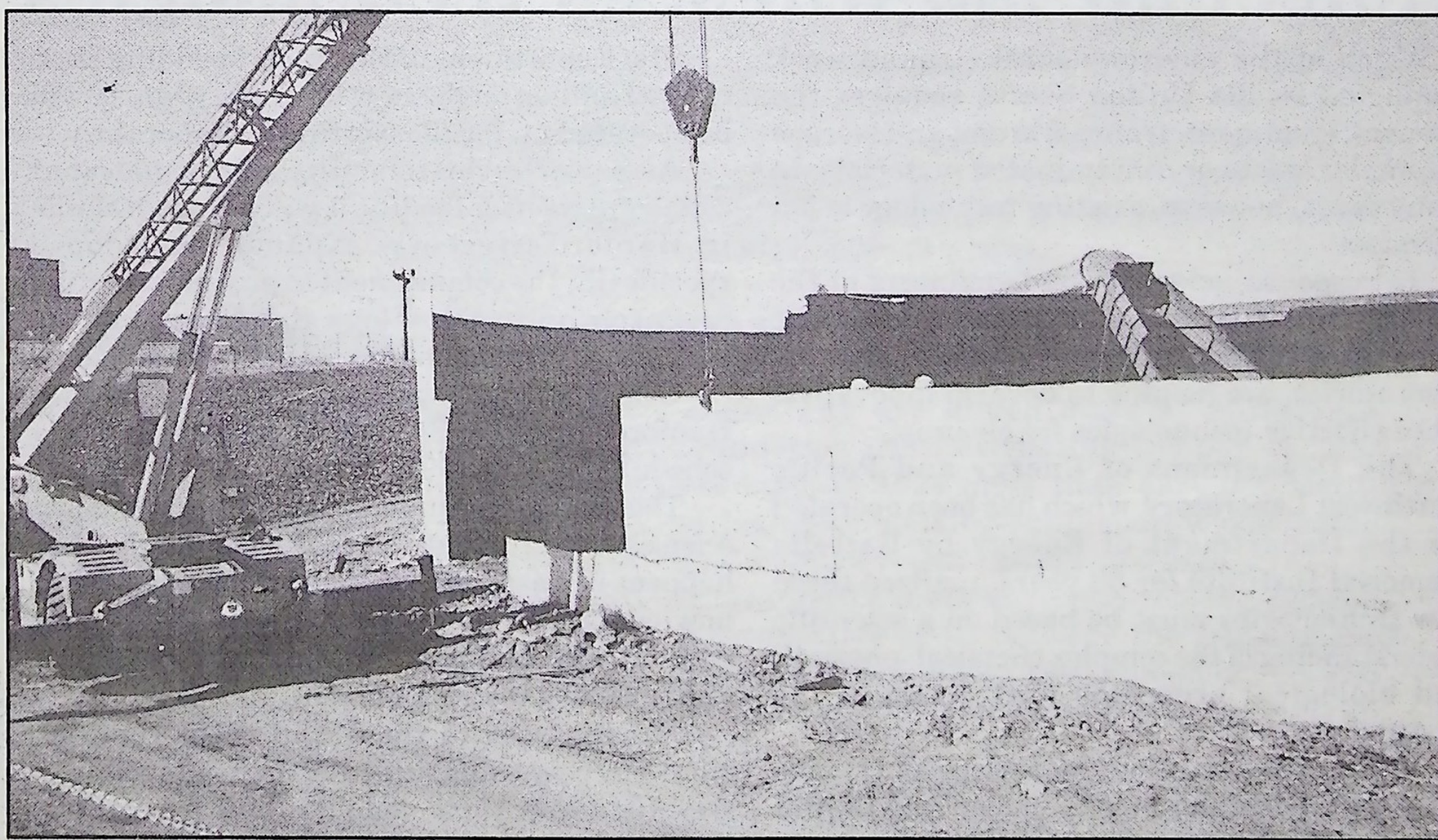
A new cleanup approach proposed by the Department of Energy several years ago was implemented at Hanford in 1994 when an Environmental Restoration Contractor team started work.

The team is composed of leader, Bechtel Hanford, Inc. and team subcontractors CH2M Hill; IT Corporation; and Thermo Analytical, Inc.

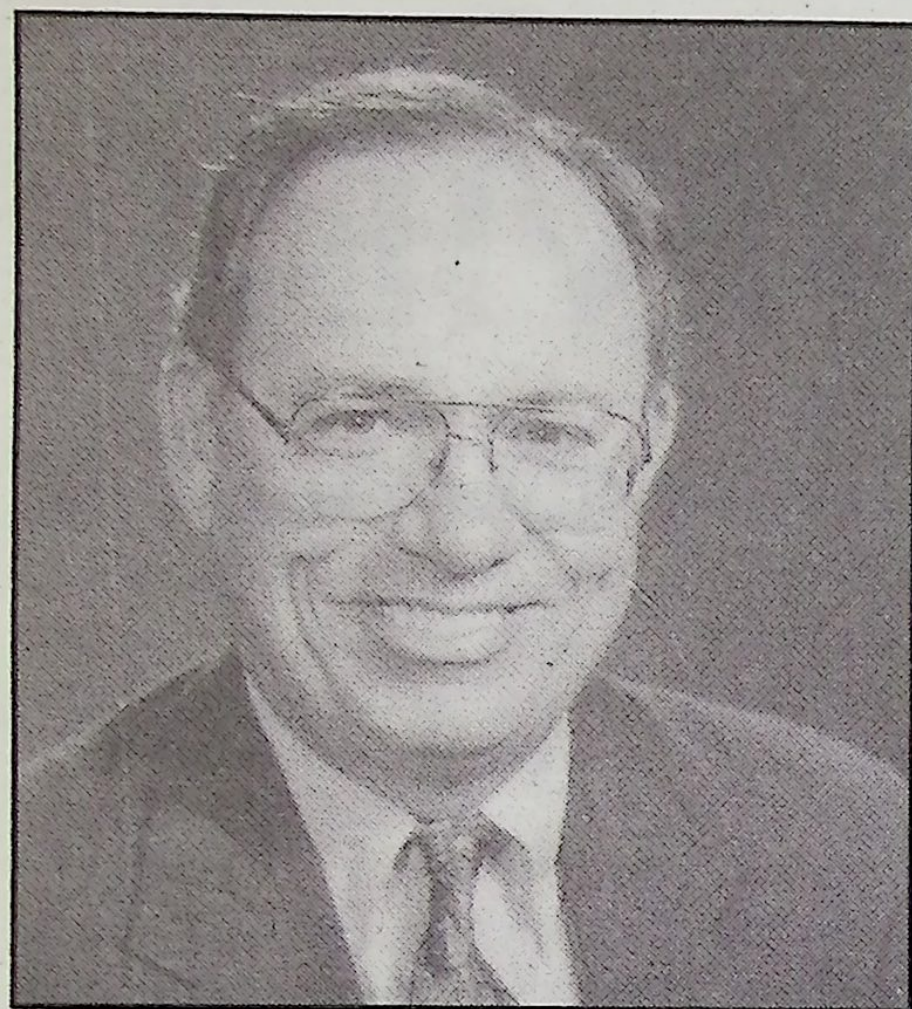
After a four-month transition, the team began work July 1. It assumed responsibility from Westinghouse Hanford Company for decontaminating and decommissioning old production facilities; deactivating the N Reactor; remedial action projects; the development of an Environmental Restoration Disposal Facility; Technology Demonstration projects; plus some site-wide support activities.

The team will perform many of the specific cleanup activities with subcontracts awarded through competitive bidding. The first major subcontract was awarded in November.

The Department of Energy's five-year, \$800 million contract with the team is a performance-based fee management contract, the first at Hanford.



Scene of demolition of the water retention basin at KE Reactor. Metal removed is cleaned and surveyed to ensure it meets release criteria.



John D. Wagoner

The Department of Energy in 1994 saw important advances in all three parts of our mission at the Hanford Site, as well as significant changes.

We published this update because I thought you, as stakeholders in Hanford, would like to read about some of them.

We already know 1995 will bring not only more technical challenges but also major fiscal questions likely to influence Hanford's progress. I encourage you to take advantage of opportunities this year to share your values with us. Together we can make better decisions concerning Hanford's future.

John D. Wagoner has been Hanford Site manager since 1990.

Nearly half of site clean

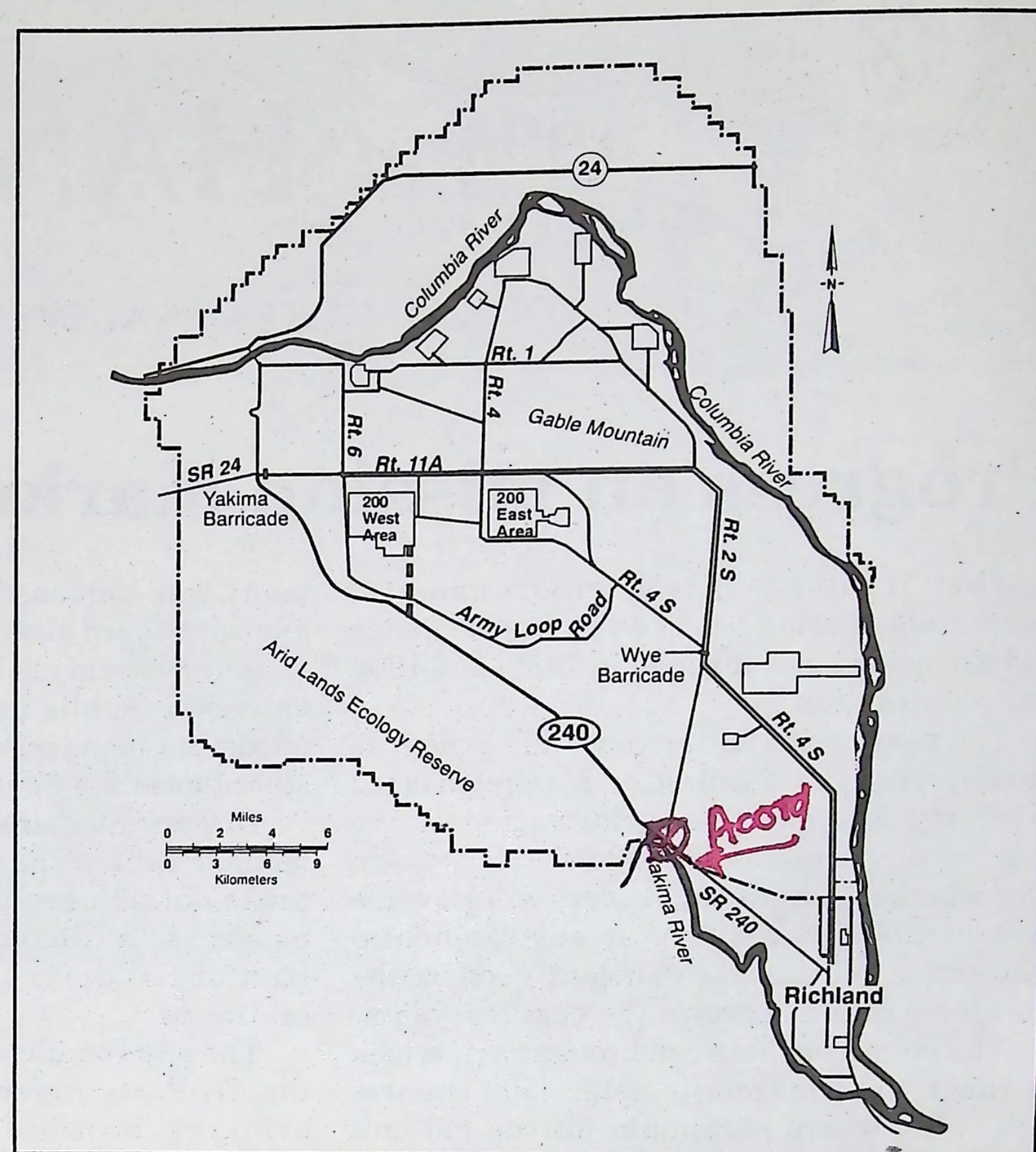
A major goal in the environmental restoration of the Hanford Site was reached Sept. 30 when the Department of Energy announced that more than 45 percent of the 1,450-square-kilometer (560-square-mile) site is clean and ready for release.

The North Slope area, across the Columbia River from Hanford's retired defense production reactors, accounts for 362 square kilometers (140 square miles) of the land ready for release.

Another 311 square kilometers (120 square miles) comprises the Fitzner-Eberhardt Arid Lands Ecology Reserve at the base of Rattlesnake Mountain.

In declaring the land clean, the Department of Energy achieved a goal that was set by John Wagoner, Hanford Site manager, and later became a milestone in the renegotiated Tri-Party Agreement that governs Hanford's environmental restoration project. Just what will happen to the land once it is released by the Department of Energy depends on decisions not yet made by the administration or Congress.

The two areas, equal to 67,178 hectares (166,400 acres), already represented some of the cleanest land at Hanford. There was chemical and military contamination—from missile and anti-aircraft gun sites, for example—that had to be cleaned up, but no known radioactive contamination.



Molecular lab will seek technologies

Much of the environmental cleanup work conducted in the United States requires the removal, treatment, transportation and storage of complex waste or contaminated materials. In many cases, however, existing technology is not adequate.

In response, scientists and engineers at the Pacific Northwest Laboratory, one of the Department of Energy's multiprogram national laboratories, are helping to develop innovative, more effective technologies for cleanup.

The Department of Energy and Pacific Northwest Laboratory, which has been operated for the Department of Energy by Battelle Memorial Institute for 30 years, realized these new technologies must be based on a scientific understanding of the complex chemical, physical, and biological processes that occur in the environment.

In July, the Department of Energy and Pacific Northwest Laboratory took a major step toward providing this fundamental scientific understanding by starting construction of the Environmental Molecular Sciences Laboratory (EMSL).

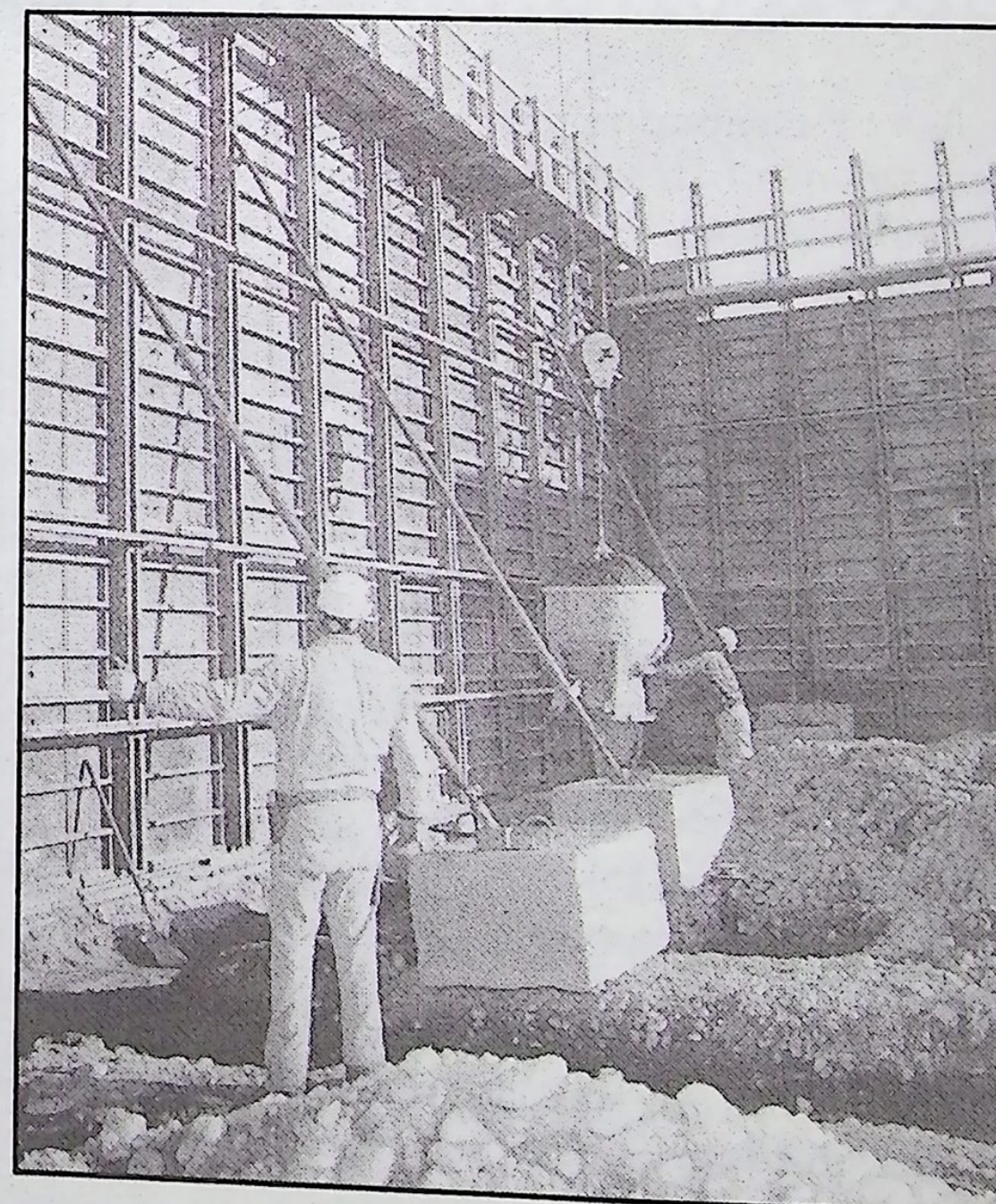
The Department of Energy is spending close to \$240 million on the new laboratory, which will be operated by Pacific Northwest Laboratory.

As a world-class facility and a national collaborative user facility, it will play a vital role in Hanford's recently expanded mission—specifically, the commitment to provide scientific research and technology development for national and global needs as well as site needs.

Construction is being managed by ICF Kaiser Hanford Company. Startup of the new facility is scheduled in late 1997.

The laboratory's unique capabilities will allow scientists to study at the molecular level, what happens in waste materials and the environment, how contaminants move through the soil and groundwater, and how the contaminants change after entering the environment.

The answers to these and other complex questions may help Pacific Northwest Laboratory scientists and their collaborators from other Hanford contractors, industry, and academia find ways to detect contamination and to treat, contain or immobilize it for a very long time.



The walls shown are for the EMSL's Thin-Film Analysis Facility. This facility will support scientists in their search for advanced containment, separation, and barrier materials for use in environmental cleanup.

Visible progress made on managing stored waste

A public-influenced strategy is being followed to safely manage nuclear fuel stored near the Columbia River, which became Hanford's top priority in 1994.

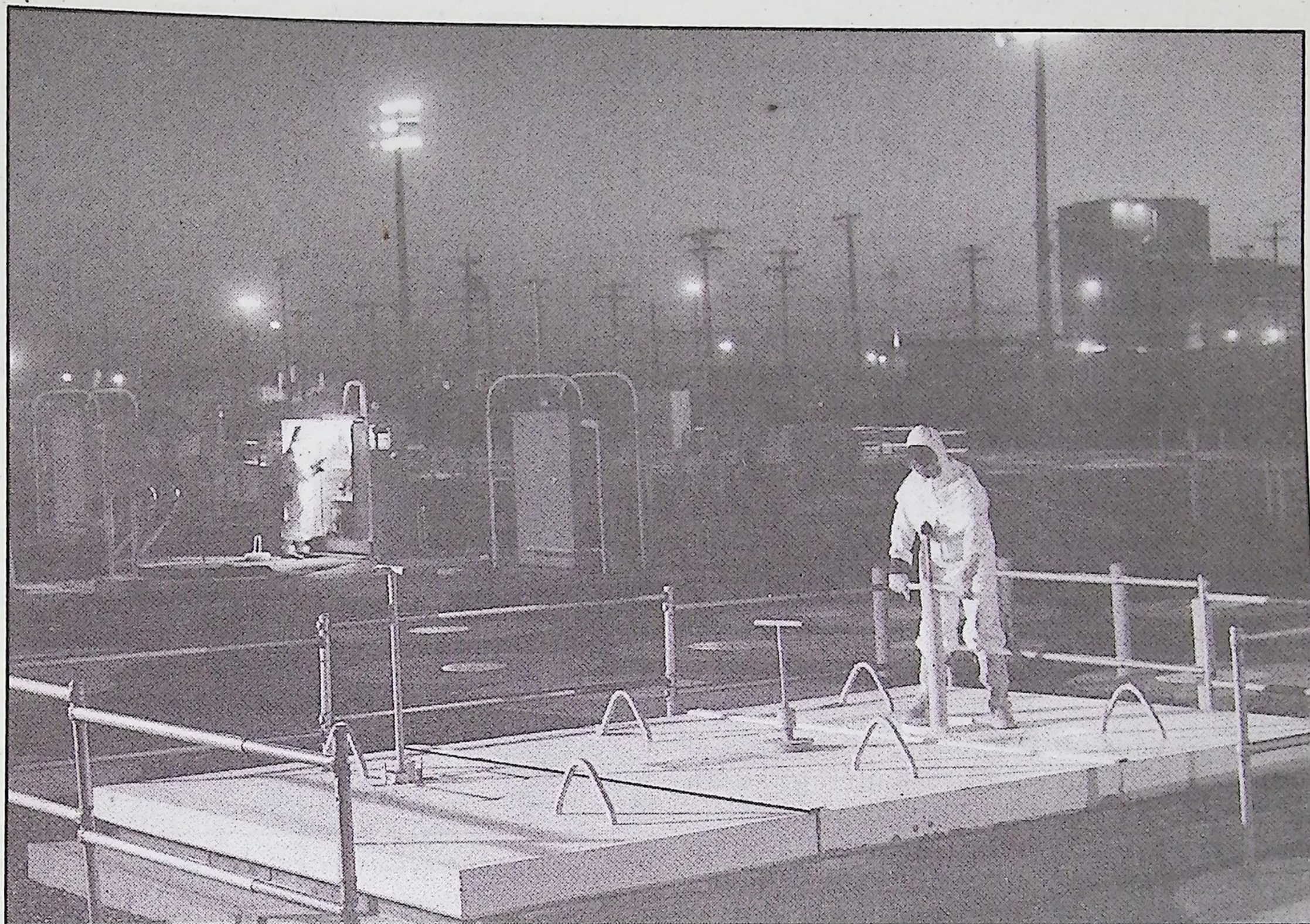
Westinghouse Hanford Company, the site's primary contractor, and partner, ICF Kaiser Hanford Company, also made major advances in 1994 on what remains Hanford's largest waste management challenge, cleanup and treatment of 57 million gallons of radioactive waste stored in 177 underground tanks near the center of the site.

Westinghouse Hanford Company established the Spent Fuel Project to focus more resources on managing about 105,000 fuel rods of highly radioactive "spent" fuel from Hanford's N Reactor. The rods, weighing about 2,100 tons, are stored in the K Basins, two outdated million-gallon concrete pools built 40 years ago less than 400 yards from the Columbia River. Some fuel has been in the K Basins for 25 years. Many rods are damaged and have corroded during their years in storage, releasing radioactive material to the basin water. The basins themselves were designed for 20 years of use but are twice that old. Also, the basins have leaked.

After stakeholder briefings and extensive studies, the Department of Energy and Westinghouse Hanford Company arrived at four options, which underwent three months of stakeholder and regulator review. Their input helped shape the recommended two-phase strategy, which supports the project's goal of removing the threat to the Columbia River. It was endorsed by Assistant Secretary of Energy Tom Grumbly and the Hanford Advisory Board in November.

Under the recommended strategy, Hanford employees will put the fuel and sludge into special water-filled packages and store it "wet" in a new facility, by November 2000. Then, using a new processing plant built next door, the fuel and sludge would be dried and stabilized so it can be put into storage for 40 to 50 years. This step is proposed to be completed by April 2006.

The progress made by Westinghouse Hanford



A Hanford employee works at a cover block to a pump pit above one of the site's large underground radioactive waste storage tanks.

Company's Tank Waste Remediation division in 1994 included the April restart of the Hanford waste evaporator. It was closed in 1989 for facility upgrades and to comply with new environmental regulations. The evaporator removes water from the liquid tank waste and 19,000 cubic meters (5 million gallons) of tank storage space was reclaimed in 1994.

That space will store liquids pumped from older tanks that are assumed to have leaks or the potential to leak. Hanford began pumping liquids from eight tanks in 1994. By year's end, one was already completed and more than 800 cubic meters (approximately 210,000 gallons) of liquid was removed by remote-controlled pumps and placed in newer, double-shell tanks.

A tank safety hazard that grabbed headlines in 1990 and was Hanford's number-one safety concern for more than three years was controlled in 1994. Thorough testing proved a seven-story pump installed in tank 101-SY is doing its job: to circulate the waste so gases from the decomposing waste no longer accumulate and "vent" from the tank in potentially flammable concentrations.

Three other waste tank safety questions were settled in 1994, after years of study and sampling. One concerned reactions of certain chemical mixtures in 20 tanks; another had to do with whether nuclear material in tank waste could start a chain reaction; the third involved the danger potential for a floating organic chemical layer in a tank.

Site helps to diversify regional economy

The Hanford Site couldn't use the metalworking equipment any more. Kaiser Aluminum and Chemical Corporation could. Thanks to the City of Richland and the Department of Energy's Economic Transition Program, the business and the tools it wanted came together in 1994, converting a Hanford resource into new jobs.

Using a provision in the Atomic Energy Community Act, the Department of Energy in August transferred a 4,000-ton extrusion press and other metalworking equipment to the City of Richland. The city in turn sold the equipment to Kaiser Aluminum, which also signed a three-year lease on the 300 Area

building housing the equipment. The company's new Richland Specialty Extrusion division, will manufacture aluminum products for commercial markets.

The conversion of the equipment for commercial use is just one of the steps Hanford has taken recently as part of its commitment to partner with surrounding communities on economic diversification.

Another example is a contract awarded to a company to provide site laundry services. This saved the estimated \$20 million it would have cost to build a new laundry facility and brought a new business to the community.

Some of the economic transition activities

under way are aimed more at building a foundation than attracting companies. For example, in 1994 more than \$250,000 worth of high-tech welding equipment was donated to Columbia Basin College in Pasco.

Hanford's innovative fish-rearing project, a cooperative effort between the Department of Energy, Washington Department of Fish and Wildlife and Yakama Indian Nation, grew in 1994.

Concrete pools formerly used to supply clean Columbia River water to Hanford's nuclear reactors have proven to be efficient nurseries for salmon—including endangered species—sturgeon and catfish.

Cleanup accelerates with old, new facilities

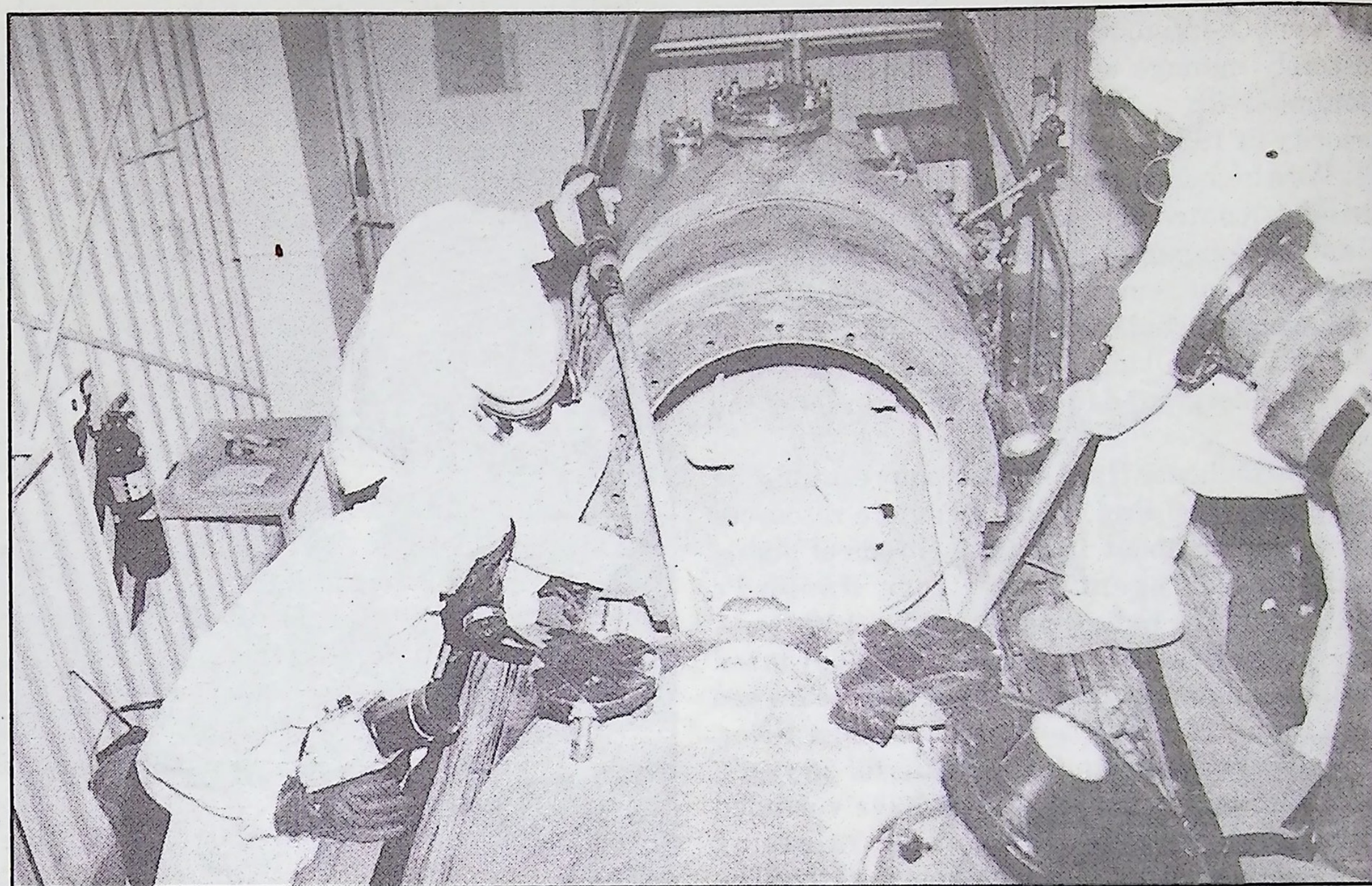
Facilities from the Hanford Site's past continued their transition from a shutdown condition to deactivation while the list of facilities ready to help clean up Hanford grew. Deactivation, the first step in cleaning up a facility, greatly reduces potential risks to employees, the public and environment. A deactivated plant can safely be left locked and unoccupied with only minimal maintenance and monitoring until decommissioning is done, saving money that can go to other cleanup work.

The most significant progress made last year by Westinghouse Hanford Company's Transition Projects team came at the closed Plutonium Finishing Plant. The plant remains the highest security area at Hanford because it houses a large inventory of plutonium compounds and materials consolidated from elsewhere on the site.

Its transition plan, the result of extensive involvement by Hanford's regulators and the public, focuses on the stabilization of 230 containers of plutonium-bearing scrap materials. Westinghouse Hanford Company and partner ICF Kaiser Hanford Company began the stabilization process in 1994, using a simpler technique that will save \$11 million and cut a year from the original schedule.

Transition Project employees accelerated the cleanup of other closed facilities, such as the Plutonium-Uranium Extraction plant and Uranium Oxide plant—whose combined transition will cut annual upkeep costs from \$34 million a year to about \$2 million—and the Fast Flux Test Facility. Westinghouse Hanford Company completed the Uranium Oxide plant deactivation early and turned it over to Bechtel Hanford, Inc., for final decommissioning.

Westinghouse Hanford Company's Waste, Analytical and Environmental Services project gained three new or expanded facilities in



Here, UO_3 workers clean out residual uranium trioxide powder from the large furnace-like calciners that were used to convert liquid uranium to the solid powder.

1994, and started another.

The 300 Area Treated Effluent Disposal Facility met a Tri-Party Agreement milestone by starting operations Dec. 29. Its construction, managed by ICF Kaiser Hanford Company, was completed \$1.8 million under budget. The new plant supports Hanford's commitment to stop the discharge of untreated wastewater by collecting and treating it for safe discharge into the Columbia River.

A new laboratory, the Waste Sampling and Characterization Facility, recently began analyzing samples for Hanford's environmental monitoring program and doing quality

control checks on analytical work done off-site. Upgrades to another Hanford analytical laboratory, more than doubled its capacity and cut the sample analysis time from the usual 200 days to less than 45 days.

Construction of an \$89.1 million solid waste processing plant started in April. It will allow analysis of more than 37,000 containers of transuranic wastes. This waste, such as contaminated work clothing, is now stored in trenches and will be repackaged at the processing plant for eventual shipment to the Waste Isolation Pilot Project in Carlsbad, New Mexico.

Workplace health emphasized

The many changes seen at Hanford in 1994 included a refocusing by the site's health services contractor.

The Hanford Environmental Health Foundation, which will mark its 30th anniversary later this year, is emphasizing three primary, team-delivered services in order to more responsively manage workplace health and safety.

Health surveillance services reduce the health and safety risks of employees through prevention and early detection of illness and

injury. These services include targeted and mandatory physical examinations for thousands of Hanford workers, industrial hygiene monitoring and sampling, and analytical laboratory services.

Health maintenance is a second service which focuses on prevention through education, counseling and industrial hygiene assessments. The service, which rounds out the continuum of care, is treatment for minor job-related injuries and illness for workers who are injured on the job or returning to work.

Summit returned

The U.S. Department of Energy's commitment to involving the public in discussions and decisions about Hanford was evident last June when the follow-up to 1993's Hanford Summit took place in Pasco.

Produced by the U.S. Department of Energy, Richland
Operations Office
John Wagoner, Manager

Battelle Memorial Institute, Pacific Northwest Laboratory
Bill Madia, Director

Bechtel Hanford, Inc.
Ed Keen, President

BCS Richland, Inc.
Mike Riddell, President

Hanford Environmental Health Foundation
Sandra Matheson, President

ICF Kaiser Hanford Company
Bob Tiller, Acting General Manager

Westinghouse Hanford Company
LaMar Trego, President



For more information:
U.S. Department of
Energy
Office of
Communications
P.O. Box 550, A7-75
Richland, WA 99352
(509) 376-7501



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