

HANFORD CLEANUP:

The First 15 Years



OREGON
DEPARTMENT OF
ENERGY

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HANFORD CLEANUP:

The First 15 Years

It's been five years since we issued *Hanford Cleanup: The First 10 Years*. That report documented – in chronological fashion – the obstacles, the successes, and the various twists and turns of the first ten years of cleanup at the Hanford Site in southeastern Washington state.

The 586 square mile Hanford Site is home to the world's first plutonium production facilities. For more than 40 years at Hanford, the federal government produced plutonium for America's nuclear weapons program. The processes generated tremendous amounts of radioactive and chemically hazardous waste. Plutonium production ended at Hanford in 1988. Since 1989, the focus has been on environmental cleanup.

May 2004 marked the 15th anniversary of the signing of the Hanford Federal Facility Agreement and Consent Order, most often referred to as the Tri-Party Agreement or TPA. The TPA, signed by the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency, and the Washington State Department of Ecology, established a 30-year timetable for cleaning up Hanford's toxic wastes. Amendments to the TPA have extended that timetable by another decade.

This seems an opportune time to update this report. There is no question it has been an eventful five years at Hanford. A range fire in July 2000 burned about 45 per cent of the site – threatening many contaminated facilities and burning over a few waste sites. Plans to privately finance the construction of facilities to immobilize some of Hanford's most dangerous wastes fell apart that same summer. To DOE's credit, they were able to recover from that debacle, and construction of those facilities is now well underway using government financing.

Significant progress was made in other key projects – moving pumpable liquids from the single shell tanks to double shell tanks, moving spent nuclear fuel to interim storage away from the Columbia River, and stabilizing tons of plutonium. In addition, we've seen the cocooning of several nuclear reactors, the dismantling of plutonium-contaminated facilities, and movement of huge amounts of contaminated soils away from the Columbia River shoreline.

This progress occurred despite substantial conflict. DOE and its regulators were often at odds. The state of Oregon, the Yakama Nation, and several citizen groups initiated or joined litigation against DOE.

Security issues at Hanford received considerably more focus following the terrorist attacks in September 2001. For a time, access to the site and site information became difficult, complicating the work and oversight.

Recently, occupational safety issues and concerns received great attention, especially in regard to possible hazards to workers in Hanford's tank farms. We saw the creation of the Hanford Reach National Monument during this five year period. And, the Hanford Advisory Board celebrated its first ten years.

Cleanup Progress

Five years ago, we asked how we would judge the second decade of what we referred to as “this incredibly expensive, extraordinarily important and formidable task called Hanford cleanup.” TPA schedules had called for the following by 2009:

- The major tank waste treatment facilities should all be built and operating. Any problems with these facilities should be resolved and treatment should be underway.
- All tank safety issues should be resolved.
- Liquids from all the single shell tanks should have been pumped to the double shell tanks.
- Spent nuclear fuel should be completely removed from the K-Basins and placed in safe, stable storage. The sludge, water and debris should also be removed from the aging basins.
- Although schedules are not set, we hope major progress will be made at the Plutonium Finishing Plant – all plutonium is stabilized, some of the surplus plutonium is moved to the Savannah River Site, and all safety issues in the facility are resolved.

Most of these tasks have already been accomplished. The start of construction of the waste treatment facilities was delayed but is now well underway (although the schedule has slipped slightly and now calls for the beginning of operations by 2011). Concerns about explosive gases or flammable materials within the tanks are resolved. And, as already mentioned, the pumpable liquids are out of the single shell tanks, nearly all of the spent nuclear fuel is out of the K-Basins (although the sludge removal fell far behind schedule), and the plutonium at the Plutonium Finishing Plant has been stabilized for long-term storage.

Frequent Conflict

The past five years have been contentious ones. At least four separate lawsuits were filed related to Hanford cleanup. And, on several occasions, the Washington Department of Ecology has exercised its regulatory authority.

The issues of dispute include plans by DOE to bring significant amounts of waste to Hanford for disposal, treatment and storage; delays in pumping liquids from the single shell tanks; authority over reclassification of high-level waste; and injury to natural resources. Of these issues, only the liquid removal from the single shell tanks has been resolved. The remainder are still active topics of dispute.

One long-standing issue – whether to restart the Fast Flux Test Facility – finally seems to have been resolved. DOE has begun deactivating the reactor, making it doubtful the reactor will ever be restarted.

The Remaining Cleanup

Since Hanford cleanup began, much of the focus has been on resolving immediate threats: concerns about tanks that might catch fire or explode; concerns about spent nuclear fuel stored in leaking, earthquake-vulnerable basins; and concerns about tons of unstable plutonium. As mentioned, we've seen great progress on all of these issues.

After 15 years of cleanup, we have reached a pivotal place in Hanford cleanup. Most of the immediate risks have been successfully resolved. Now the focus is squarely on the quality of the remaining cleanup. And there is considerable debate about that issue.

There are still plenty of long-term risks. Extensive groundwater contamination remains and huge amounts of waste are still moving in Hanford's sub-surface to the groundwater, including high-level radioactive waste leaked from the tanks. Highly radioactive materials remain in unlined burial grounds. And, until we can put those vitrification facilities to use, 53 million gallons of high-level waste remains in 177 underground storage tanks.

In recent years, DOE Headquarters has stressed a quicker, less expensive cleanup. This is a key part of their accelerated cleanup program and their more recent risk-based end states initiative. Both mean leaving more waste in place. Both will require institutional controls and other restrictions to keep people away so as not to be harmed by the waste left behind.

DOE also proposed changes in the tank waste treatment program consistent with the push by DOE Headquarters to reduce the cost and time of cleanup. The Tri-Party Agreement requires that the tank waste all be vitrified. In the fall of 2001, Office of River Protection Manager Harry Boston said DOE was exploring alternatives to vitrifying all of Hanford's tank waste in hopes of saving tens of billions of dollars and completing the cleanup decades ahead of schedule. Three technologies were examined and DOE is now resting its hopes on another form of vitrification to treat the majority of Hanford's tank waste.

If there is one lesson in reviewing the first 15 years of Hanford cleanup – and this one lesson is repeatedly evident – it's that there is no quick fix for the long-term risks at Hanford. DOE must simply continue with the methodical approach as outlined by Tri-Party Agreement milestones to lessen and ultimately eliminate these hazards.

The lessons from Hanford's past are among the reasons

we believe it is important to document the Hanford cleanup. We can see that the cleanup challenges at Hanford are continually underestimated in terms of their difficulty, their complexity, and their cost.

In addition, by documenting the commitments, the activities, the progress and failures, over the long period of time that cleanup will take, we can help to ensure that the original goals for cleanup are fulfilled. Otherwise, it can be all too easy to lose track of previous commitments and to gradually move in other directions.

In writing this report we have once again drawn heavily from coverage by the news media – the *Tri-City Herald* in particular, but also from the *Oregonian*, the *Seattle Post-Intelligencer*, the *Associated Press* and other media sources.

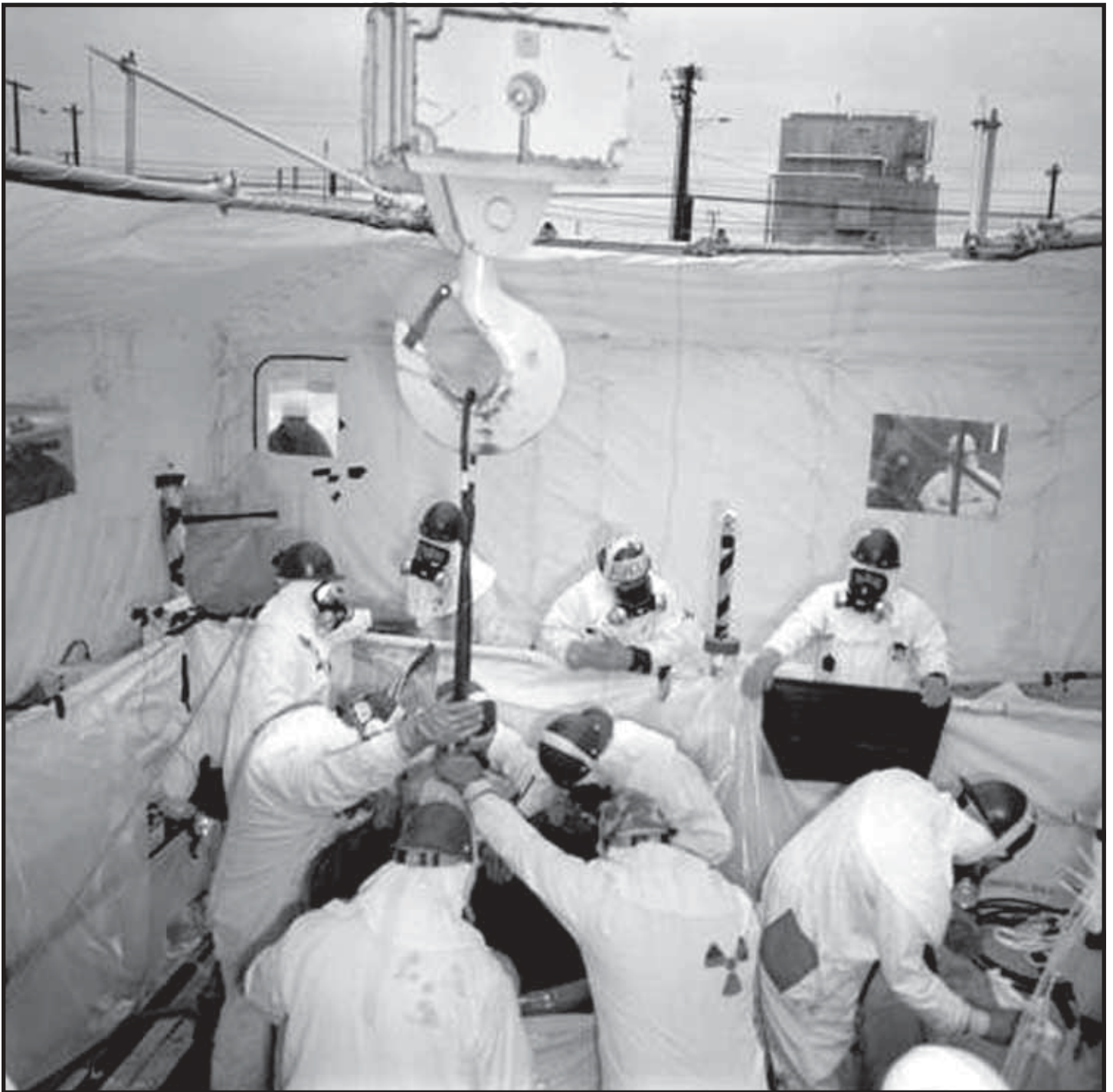
As we have now passed the 15th anniversary of the TPA, some of the same concerns and questions we have dealt with before still remain. Funding has and likely will always be a major issue. Those of us concerned about Hanford cleanup have been somewhat nervous about the impact of DOE's plans to accelerate closure at several sites around the nation, such as Rocky Flats in Colorado and Fernald in Ohio. Getting Congress to appropriate sufficient funding for DOE's environmental cleanup program has been successful because there has been support from all the states impacted by DOE facilities. We worry about what happens to that support when sites are closed in Colorado, Ohio and other states. Will the Congressional delegations from those states still fight for cleanup funds in other states? This is not a new question. It is one that has been asked for several years. But, it is one we may begin to see the answer to within the next few years.

Federal funding for Hanford cleanup is expected to peak with the fiscal year 2006 budget. However, unlike at Rocky Flats and Fernald, cleanup at Hanford will continue well beyond 2006. Yes, plutonium stabilization is complete, and yes, the spent fuel project will soon be complete, and those were very expensive projects. But, there are other needs at Hanford which require funding. Hanford still has no facilities to treat or package remote-handled transuranic waste. Until those facilities are in place, no work will be done to retrieve waste from burial grounds such as 618-10 and 618-11 – which pose a long-term threat to the Columbia River. The groundwater protection program has been under-funded for years. Lack of funding has also resulted in abandoning plans to move Hanford's strontium and cesium capsules to dry storage. And of course, construction of the tank waste treatment facilities will require a continued large investment of funds for the next 5-7 years.

The public's insistence that cleanup continue has – without question – had a huge impact at Hanford. The successes at Hanford are a shared accomplishment by all who have worked to see cleanup move forward. But the job is far from over and your continued involvement is absolutely necessary. As you review *Hanford Cleanup: The First 15 Years*, rejoice in the accomplishments, shake your head at the missteps, and steel yourself for the hard work yet to be done.



Some Hanford facilities — such as N Reactor above — are located very close to the Columbia River. The zig-zag trench at the bottom of the photo was a liquid waste disposal trench. Another trench is just out of view, farther to the left. The soil and groundwater between the trench and the river is heavily contaminated.



The photo above shows the hazardous environment that many workers face in trying to clean up Hanford.

May 1989

- Representatives of the U.S. Department of Energy (DOE), the Environmental Protection Agency (EPA) and the Washington Department of Ecology (Ecology) sign the Hanford Federal Facility Agreement and Consent Order. This agreement, most often called the Tri-Party Agreement, or TPA, sets schedules and tasks to accomplish cleanup of the Hanford Site within 30 years and bring the site into compliance with environmental laws. The agreement sorts out overlapping authorities between Ecology and EPA.

"This agreement means that, at long last, we can begin a massive effort to clean up the 45 years of accumulated chemical and nuclear wastes at Hanford."
– Washington Governor Booth Gardner
(Tri-City Herald, May 16, 1989).
- Energy Secretary James Watkins tells a Senate Committee the Waste Isolation Pilot Plant will not open September 1 as scheduled. The facility, located in New Mexico, is designed for the permanent underground disposal of a specific type of radioactive waste — called transuranic — generated as part of nuclear weapons production.
- DOE officials study a Hanford test reactor, the Fast Flux Test Facility (FFTF), as a potential producer of plutonium 238 to power spacecraft.
- Hanford Site Manager Mike Lawrence says cleanup will create 1,400 new jobs between 1993 and 1999. There is still expected to be an overall reduction in Hanford jobs, due to cutbacks in production. A state jobs report for April shows Hanford has 12,400 employees, a drop of 200 from March.

June 1989

- The Westinghouse Hanford Company gets a "satisfactory" rating from DOE for its performance in running the Hanford Site during the six month period which ended March 31, 1989. Westinghouse Hanford is awarded 62.5 percent of its performance fee, its lowest rating in 18 months as Hanford's prime contractor. Westinghouse took over from the Rockwell Hanford Company in 1987.
- Washington Senator Slade Gorton writes Secretary Watkins in support of completing an unfinished commercial nuclear reactor at Hanford, and using it to make tritium for the nation's nuclear weapons program. Oregon Senator Mark Hatfield and Idaho Senator James McClure had earlier written opposing the plan to complete Washington Nuclear Plant #1.
- The FBI raids DOE's Rocky Flats facilities near Denver. The FBI is investigating numerous environmental violations.
- Representative Tom Foley of Spokane is elected Speaker of the U.S. House of Representatives.

"The important thing is to get it begun. Committing 'X' billion for the cleanup is probably impossible. You can't bind a future Congress" to future spending.
– Washington Congressman Tom Foley.
(Spokesman Review, June 7, 1989).
- Energy Secretary Watkins announces a series of ten initiatives to strengthen environmental protection and waste management activities at DOE's defense nuclear facilities. Watkins says environmental health and safety is now DOE's number one priority.

"The way we've operated these plants in the past, was: 'This is our business, it's national security, everybody else butt out.'

June 1989 continued

They're not going to be operated that way any more." – Deputy Energy Secretary W. Henson Moore. (Tri-City Herald, June 17, 1989).

"The chickens have come home to roost and years of inattention to changing standards and demands regarding the environment, safety and health are vividly exposed to public examination, almost daily. I am certainly not proud or pleased with what I have seen over my first few months in office." – Energy Secretary James Watkins. (Tri-City Herald, June 28, 1989).

- A new Congressional study shows DOE continues to emphasize production while giving little attention to public health and safety issues. The report cites 14 examples — including nine at Hanford — of a lack of, or disregard for safety.

- A work plan is released for the first site to be cleaned up under the TPA. Battery acid, solvents, paints, anti-freeze and other chemicals will be cleaned up at Hanford's vehicle maintenance area, which is near the Richland city water wells.
- The Natural Resources Defense Council (NRDC) and other environmental groups file suit to force DOE to conduct a comprehensive analysis of its safety and environmental problems.

"It is time that the Energy Department came clean with the American public about its plans for what is really one of the nation's largest and most dangerous industrial operations." Dan Reicher, NRDC attorney. (Tri-City Herald, June 28, 1989).

July 1989

- A General Accounting Office (GAO) report says DOE's conclusion that there is little or no environmental impact from Hanford's leaking storage tanks is not convincing. The report urges DOE to pump waste out of the tanks without delay.
- Washington Governor Booth Gardner advocates moving Hanford's eight shut-down plutonium production reactors away from the Columbia River as soon as possible. The comments are made as part of a draft environmental impact statement hearing on decommissioning plans for the reactors.

Hanford's waste storage tanks

During its 45 years of plutonium production, Hanford generated enormous amounts of radioactive and chemically hazardous wastes. Beginning in 1944, Hanford workers began to store the most hazardous of these wastes in large underground tanks. The first tanks had just a single shell of carbon steel for containment. Eventually, 149 of these single-shell tanks were built at Hanford. These tanks ranged in size from 55,000 gallons to one million gallons, with most of the tanks at least half a million gallons in size. After many of these tanks began to leak, tanks with double shells of carbon steel were built beginning in the late 1960s. Twenty eight double-shell tanks, all a million gallons or larger in size, were built at Hanford. Some of these tanks are also now nearing the limits of their design life.

Hanford's 177 waste storage tanks now hold about 53 million gallons of highly radioactive and chemically hazardous waste. Sixty seven of these tanks have leaked an estimated one million gallons of waste into the soil.



Hanford's tanks under construction.

August 1989

- Energy Secretary Watkins announces a five year cleanup plan for DOE sites. Fully implementing the plan will require \$19.5 billion. Washington Senator Brock Adams and Congressman Norm Dicks, concerned about funding cleanup activities in the future, reintroduce legislation to establish a special trust to pay for long-term cleanup of DOE nuclear sites.

*"Unfortunately we don't have a five year problem. We have a 30 year problem."
– Washington Senator Brock Adams.
(Longview Daily News and Associated Press, August 2, 1989).*

- DOE invites governors of 11 states, including Washington, to negotiate formal, comprehensive agreements which would allow direct access and environmental monitoring by the states at DOE facilities.

- DOE Secretary Watkins makes his first visit to Hanford. He says he expects N Reactor to close permanently, and adds it is time to "pay back the environment."

"I'd like to see Hanford become the flagship for waste management research."

*– Energy Secretary James Watkins.
(Spokesman Review, August 29, 1989).*



Secretary Watkins and Mike Lawrence.

- PCBs are discovered in six submarine reactor vessels disposed at Hanford. Governor Gardner and Oregon Governor Neil Goldschmidt write the Navy, asking them to analyze risks posed by the PCBs before more reactor vessels are shipped to Hanford.

September 1989

- The Navy agrees to remove PCBs from six submarine reactor compartments disposed at Hanford.

- The EPA adds four Hanford areas to its Superfund National Priorities list. They are the 100, 200, 300 and 1100 areas.

Site layout

The 586 square mile Hanford Nuclear Site is located in south central Washington near the Tri-Cities of Richland, Pasco and Kennewick. The Columbia River flows through the Hanford Site. Much of the land is arid, gently-rolling sagebrush desert.

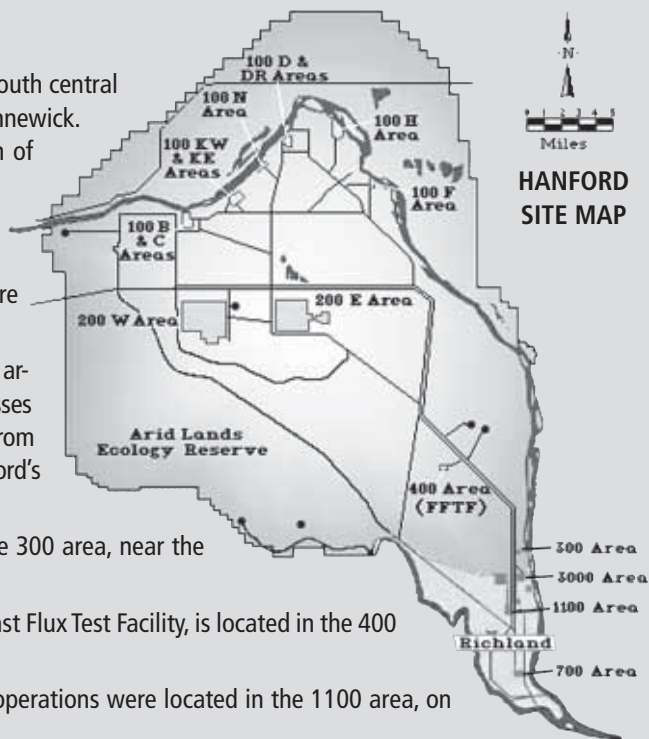
Numbers are used to designate specific areas at Hanford. At the north end of Hanford, along the Columbia River, are the 100 areas where nine nuclear production reactors were built. All of these reactors are shut down.

Hanford's chemical separations plants are situated in the 200 areas, near the middle of the site. A series of chemical processes were conducted in these huge plants to separate plutonium from irradiated nuclear fuel. The 200 areas are also where Hanford's 177 underground waste storage tanks are located.

Laboratory, research and manufacturing facilities are in the 300 area, near the southeast corner of the site.

A shut-down research and test nuclear reactor, called the Fast Flux Test Facility, is located in the 400 area, just northwest of the 300 area.

Warehouses and vehicle maintenance and transportation operations were located in the 1100 area, on the site's extreme southern border.



- DOE announces plans to restart PUREX in the fall of 1990 to process 2,100 tons of spent nuclear fuel stored in water-filled basins near the K Reactors. At least one of the basins has leaked in the past.

*“Even if we don’t need plutonium, we have to process the material that is out there.”
– Hanford Site Manager Mike Lawrence.
(Tri-City Herald, October 7, 1989).*

- Governor Gardner writes Energy Secretary Watkins, saying waste from Rocky Flats should not be sent to Hanford for storage. Because of delays in opening the Waste Isolation Pilot Plant, and refusals by Idaho to allow more waste to be stored at the Idaho National Engineering Laboratory, DOE is looking for alternative sites for Rocky Flats waste.

“The state of Washington has done far more than its share of this kind of duty for the nation.” – Dick Milne, Governor Gardner spokesman. (Tri-City Herald, October 7, 1989).

- Energy Secretary Watkins establishes a new position of Assistant Secretary for Environmental Restoration and Waste Management. The new Assistant Secretary will implement DOE’s five year plan and provide central management for cleanup at DOE sites.

- Battelle Pacific Northwest Laboratory releases a five year old report on the risk of an explosion in Hanford’s underground waste storage tanks. The report concludes that adding ferrocyanide to tanks in the 1950s increased the risk of an explosion. Hanford managers don’t dispute the report’s conclusions, but say temperatures in the tanks are too low to cause an explosion. Ferrocyanide was added to about two dozen tanks in the early 1950s to separate cesium from the waste. Under high temperatures and at certain concentrations, ferrocyanide can explode.

- Ohio Senator John Glenn urges nominees to the Defense Nuclear Facilities Safety Board to examine conflicting reports about tank safety at Hanford.

Plans for treatment of Hanford’s high-level tank waste

In 1989, DOE’s plan for Hanford’s tank waste was to remove the waste from the tanks, separate the waste into its high and low-activity constituents, and immobilize the waste using two different processes. The high activity waste would be mixed with materials to form a molten glass. The glass would be poured into steel canisters where it would harden. This process is called vitrification. The low activity waste — which generally contained lower levels of radioactivity in large amounts of material — would be mixed with cement, fly ash and other materials. It would then be poured into huge 1.4 million gallon underground cement vaults, where it would harden into a cement-like substance called grout. It was expected that about 50 grout vaults would be needed at Hanford.

DOE intended to use one of Hanford’s first chemical reprocessing facilities, B Plant, for the pre-treatment process to separate the high and low activity portions of the waste. Although DOE officials had concerns about the age and condition of B Plant, they believed it would be less costly and quicker to use than building a new facility.

Within a few years, DOE scrapped plans to use B Plant, abandoned grout — primarily because of stakeholder concerns over technical problems with the performance of grout — and stopped all planning, design and construction work related to the vitrification plant. By 1999, DOE was moving forward with plans for a new pre-treatment facility and vitrification plants for both high and low activity wastes. Initially, those facilities were to be paid for by private companies, and the treated, vitrified glass would be “sold” back to DOE. Huge cost estimates for that process killed “privatization,” and DOE resumed work with a new contractor and a more traditional “buy as you go” process.

Construction of the huge vitrification complex began in July 2002, and operations are scheduled to begin in 2011. In recent years, DOE again changed directions on treatment of the low-activity waste. DOE now proposes to immobilize the majority of the low-activity waste using a different type of vitrification technology.

October 1989 continued

"The risk of explosions in waste tanks has not received the attention it deserves." – Ohio Senator John Glenn. (Tri-City Herald, October 18, 1989).

- DOE announces it will begin construction in November on four new grout vaults.

*"It will turn millions of gallons of low-level radioactive wastes at Hanford into a block of solidified grout that will protect the environment for the next 10,000 years or more."
– John Van Beek, Westinghouse Hanford Company (Tri-City Herald, October 21, 1989).*

- Governor Gardner appoints a special team to conduct an in-depth investigation of the explosive risk posed by ferrocyanide in some of Hanford's tanks.
- Hanford Manager Mike Lawrence says DOE made a "mistake in judgement" by not releasing a five year old Battelle report on tank safety until a week ago. Lawrence says the report raised issues that need further research. He also says the bottom of a Hanford tank ruptured in 1965 and released radioactive steam into the air. The incident was caused when moisture trapped between the floor of the tank and the concrete liner turned to steam. The steam caused an eight foot bulge in the steel liner.
- The final shut down of N Reactor begins.

November 1989

- DOE's Advisory Committee on Nuclear Facility Safety, chaired by John Ahearne, begins to examine the risk of a Hanford tank explosion.

*"I don't believe an explosion is credible."
– Hanford Manager Mike Lawrence. (Seattle Post-Intelligencer, November 5, 1989).*

- DOE officials say it will cost more than they anticipated to stop discharge of liquid wastes into the soil. The discharges continue, although they are being reduced.

"You can't just turn it off." – Ken Morgan, DOE spokesman. (Tri-City Herald, November 15, 1989).

- DOE awards a \$550 million construction contract to begin building a high-level waste vitrification plant. Construction work is scheduled to begin in 1991 and plant operations to begin in 1999.

Liquid waste discharges

Hanford's chemical separation facilities, reactors, laboratories, and other facilities created enormous amounts of liquid wastes. The most hazardous of these wastes were stored in underground tanks. The remainder of these liquids were dumped into the ground. The Environmental Protection Agency estimated that more than 444 billion gallons of contaminated liquids were dumped into the ground at Hanford. These discharges resulted in widespread contamination of the groundwater and the layer of soil between the surface and the groundwater (called the vadose zone).

More than 400 different liquid waste streams were identified at Hanford. DOE, EPA and Ecology agreed that the 33 worst waste streams were to be stopped or sent to treatment facilities by June 30, 1995, with the remainder stopped or treated by October 31, 1997.

Even though most plutonium production activities had ended at the time the Tri-Party Agreement was signed in May 1989, as much as 22,000 gallons of contaminated water a minute was still being dumped into the ground at Hanford.

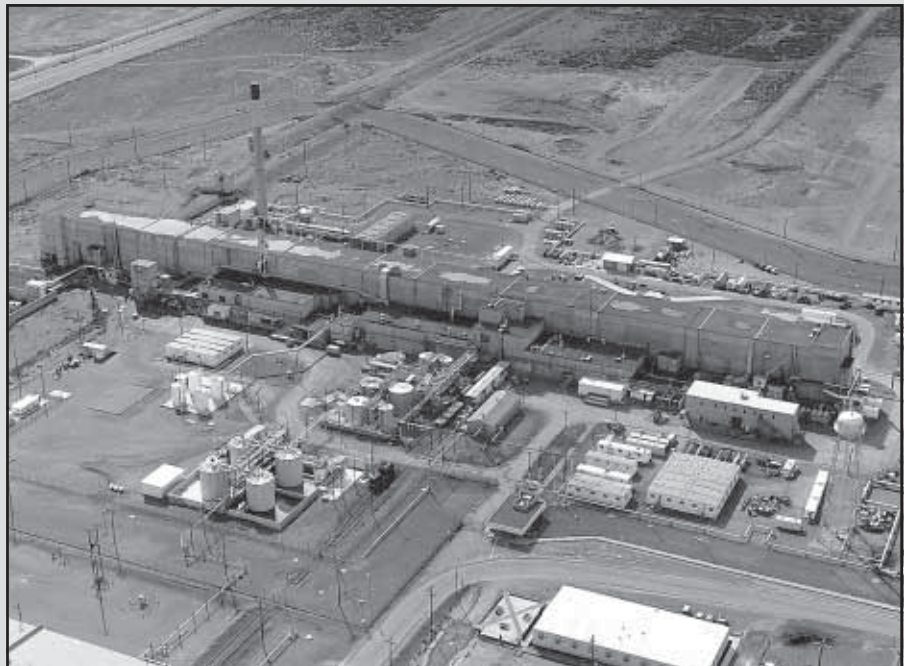
- Energy Secretary Watkins agrees to declassify all Hanford documents from 1944-1960 which describe radioactive releases to the environment. His action comes in response to a request from a scientific panel directing a study into public exposures from past radioactive material releases from Hanford to the environment.
- A National Research Council panel recommends DOE not build a new \$1.35 billion plutonium processing facility, and should instead focus on cleaning up its nuclear production sites. The panel says the nation's nuclear arsenal can be sufficiently maintained without new processing capacity. The panel also determines a significant quantity of plutonium has accumulated in the ventilator ducts at Hanford's Plutonium Finishing Plant – some beyond the filter systems.
- PUREX resumes limited operation. The unexpected shutdown of the facility had left chemicals and radioactive materials in miles of pipes. The "cleanout" run is expected to take 4-6 weeks.

PUREX

The Plutonium URanium EXtraction facility, or PUREX, was the largest chemical processing facility at Hanford. It is 1,005 feet long, 104 feet tall and 61 feet high. Through a series of different chemical processes, the PUREX facility separated uranium and plutonium from nuclear fuel irradiated in Hanford's reactors. PUREX accounted for about 80 percent of the 53 tons of plutonium produced at Hanford.

PUREX and other chemical separations plants were often referred to as "canyon" facilities, because of the cavernous appearance inside. Its main canyon portion, 860 feet in length, contained 11 cells where the different chemical processes occurred.

Construction of PUREX began in April 1953 and the plant was essentially complete two years later. "Hot" operations began in January 1956. In 1967, PUREX became the lone operating processing facility at Hanford.



Hanford's PUREX Plant.

In 1972, the PUREX plant began a planned 18 month shutdown period that ultimately lasted 11 years. Extensive modifications, along with the construction of new double shell waste storage tanks occurred during this time. The plant re-opened in 1983, then closed again for a year beginning in December 1988. After a short stabilization run to clean out unprocessed material, the plant closed in early 1990. In October 1990, Energy Secretary James Watkins ordered the facility into a standby status. A final closure order was issued by DOE in December 1992. Deactivation began in 1993 and ended in May 1997.

January 1990

- Washington state officials conclude ferrocyanide in Hanford's tanks does not pose a serious risk of explosion.
- The Bush Administration proposes a budget which will increase Hanford's funding to an all-time high \$1.2 billion for fiscal year 1991. The budget also calls for closure of the Fast Flux Test Facility (FFTF).
- About 150 people attend a rally in Richland to support continued operation of FFTF.

The Fast Flux Test Facility (FFTF)

The Fast Flux Test Facility (FFTF) is a nuclear test reactor, cooled by liquid sodium. It was built to support liquid metal reactor technology, conduct reactor safety research, and demonstrate technology for breeder reactors.

Construction of the FFTF was completed in 1978, and following extensive testing, the reactor began operations in 1982. During its ten years of operation, the FFTF tested advanced nuclear fuels, materials, and safety designs. It also produced a large number of different medical isotopes and made tritium for the nation's fusion research program.

DOE eventually abandoned the liquid metal reactor program. After considering other potential uses for the reactor, DOE officials ordered it into a standby mode in April 1992, and ordered permanent shutdown in December 1993.

Over the next decade, supporters of the reactor sought a new mission for the FFTF and were successful in keeping the reactor in a standby mode while other potential missions were more thoroughly evaluated. Potential missions considered for the FFTF included producing tritium for the nation's nuclear weapons program; radioisotopes for cancer research and treatment; plutonium 238 to power space satellites; and a variety of research missions. The tritium issue sparked fierce opposition from citizen groups, the state of Oregon and others over the potential return of a production mission at Hanford, the generation of additional waste and the cost of operating the reactor.

That issue was finally resolved in December 2001, when Energy Secretary Spencer Abraham ordered the permanent shutdown of the facility. By April 2003, workers began draining hot liquid sodium from a secondary cooling loop of the Fast Flux Test Facility, effectively beginning its permanent shutdown.



February 1990

- Tri-City Herald Editor Kelso Gillenwater challenges residents of the Tri-Cities to "advocate and lead a bold new strategy for Hanford that finally and fully acknowledges the harsh lessons of both the past decade and the past month." Gillenwater urges the Tri-Cities to clean up the site while developing and exporting new technologies; to build regional unity in favor of the cleanup mission; and work to reduce DOE's role at Hanford and in the Tri-Cities.
- "We no longer have a future in the defense business and we should quit wasting everybody's time and money pretending we do."*
– Tri-City Herald Editorial, February 4, 1990.

March 1990

- A processing run at PUREX is completed and preparations begin for a shutdown. A one year outage is planned to prepare for processing N Reactor fuel stored at the K-Basins.
- Westinghouse Hanford officials say detailed design is underway and construction of the vitrification plant is on schedule to start in July 1991. The facility is to be built in the 200 East area near B Plant.

K-Basins

For more than 25 years, more than 2,000 metric tons of spent nuclear fuel was stored in two water filled basins at Hanford's K-East and K-West reactors, just a few hundred yards from the Columbia River. The fuel came from Hanford's N Reactor.

The spent fuel was stored in nearly 7,000 canisters. Spent fuel in the K-West basin was encapsulated and sealed in water-filled containers. The spent fuel in the K-East basin was in degraded, open containers, and in direct contact with the basin water. This resulted in heavy corrosion of some of the fuel and contamination of the water in the basin. Some of the fuel in the K-West basin was also corroded.

In mid-1994, it was determined the basins were susceptible to a large earthquake, which could quickly drain the water from the basins, exposing the fuel to air. The fuel could then self-ignite and spread a plume of radioactive materials into the environment. That issue was partially resolved by structural modifications to the basins.

The fuel was never intended to be stored in the K-Basins for an extended period of time. It was supposed to be reprocessed in the PUREX facility.

Moving the fuel to safer, long-term storage away from the river became a top priority at Hanford and within the DOE nuclear weapons complex. The plan was to clean and repackage the fuel, vacuum dry it, and then seal it in canisters with an inert gas. It will be stored indefinitely in a new Canister Storage facility in Hanford's 200 area.

Fuel removal began in December 2000. All of the fuel should be removed from the basins sometime during 2004. Removal of the contaminated sludge and water will follow.

- Energy Secretary Watkins announces a proposed DOE rule to protect whistleblowers who work for DOE contractors. DOE employees already have legal protection against retaliation.
- Energy Secretary Watkins announces a "Tiger Team" investigation will soon begin at Hanford. The Tiger Team will spend two months examining how Hanford operates, including its environmental, safety and management practices.
- Hanford officials announce they are examining a new risk for explosion in Hanford's waste storage tanks – one caused by a buildup of hydrogen. They characterize the risk as low, but admit they need more information.

"The worst case is any explosion that could cause the dome to collapse and send the contents up to the air. I can't sit here and say it's not going to happen."
– Hanford Site Manager Mike Lawrence.
(Tri-City Herald, March 24, 1990).
- Energy Secretary Watkins chastises Hanford Manager Mike Lawrence for his statements about the risk of a tank explosion.

"That was Lawrence's statement, that's not our statement. I'm sorry it was said that way." – Energy Secretary James Watkins. (Tri-City Herald, March 29, 1990).
- A GAO report says nearly two-thirds of 294 health and safety problems cited at Hanford since 1986 remain unresolved. The report says DOE and its contractors have been slow to correct health and safety problems at most DOE sites.
- Washington state officials say DOE's 1991 budget request to Congress is \$245 million short of what is needed for work to continue on schedule at Hanford.
- The Defense Nuclear Facilities Safety Board concludes the probability of an explosion is low because of ferrocyanide in some of Hanford's single-shell tanks. However, based on concerns about high levels of hydrogen in some of the double-shell tanks, the Board recommends DOE develop a program for continuous monitoring of conditions in those double-shell tanks.

Defense Nuclear Facilities Safety Board

The Defense Nuclear Facilities Safety Board (DNFSB) is an independent, federal advisory board with external oversight responsibilities at DOE's nuclear weapons facilities. The DNFSB reviews operations and activities throughout DOE's defense nuclear complex, and makes recommendations to the Secretary of Energy so as to protect worker and public health and safety. Should DNFSB discover an imminent or severe threat to public health and safety, DNFSB is required to transmit its recommendations directly to the President, as well as to the Secretaries of Energy and Defense.

April 1990

- The first team of outside experts arrives at Hanford to study tank safety issues. At least 20 tanks are known to generate hydrogen.
- Hanford Manager Mike Lawrence says further studies indicate the risk of a hydrogen explosion is low, and if an explosion did occur, it would not likely rupture a tank.

"There is good evidence the tank system could withstand what could occur in there.

The consequences are far less than we thought." – Hanford Manager Mike Lawrence. (Tri-City Herald, April 17, 1990).

- Hydrogen is vented from tank SY-101. Samples show the hydrogen concentration at 3.4 percent, below the 5 percent needed for flammability.

Tank SY-101

During the early 1990s, considerable attention was focused on tank SY-101, located in Hanford's 200 West area. Chemical reactions in the tank's waste created hydrogen, which was trapped in the solids at the bottom of the tank. When enough hydrogen gas was generated, it forced its way up and into the open space of the tank. The concern was that during these hydrogen "ventings," which came to be known as tank "burps," the hydrogen concentration would be high enough to burn or explode if there was a spark inside the tank. These ventings occurred every 100 days or so.

In July 1993, a giant circulation pump was installed in SY-101. The 64-foot tall, 19,000 pound pump circulated liquid waste from the tank's upper layer to the bottom where jet nozzles discharged the fluid. Hydrogen was still generated in the waste, but was vented in small steady releases, rather than in large infrequent releases.

Although the pump was successful at mixing the waste and reducing the risk of a fire or explosion, tiny gas bubbles trapped in the crust on top of the waste caused the crust to grow to about 10 feet in thickness, threatening to overflow the tank. In response, Hanford officials pumped about 90,000 gallons of waste from tank SY-101 in December 1999, and added that much water to dilute the waste. That lowered the level of the tank by about two feet. About a quarter million additional gallons of waste was pumped out in March 2000. The tank was removed from the Wyden Watch List in February 2001.

May 1990

- DOE's "Tiger Team," arrives at Hanford.

"We are here on very serious business." – Phil Hamric, Tiger Team Leader. (Tri-City Herald, May 22, 1990).

June 1990

- A team looking at new missions for FFTF presents its report to Governor Gardner. The conclusion is that FFTF needs a combination of missions to be financially viable.
- A 16 member DOE Advisory Committee on Nuclear Facilities Safety arrives at Hanford to review tank safety issues.
- A GAO report says DOE's plans to restart PUREX are inadequate and provide no assurances the facility can be operated safely. The report also says DOE has not demonstrated a need for weapons-grade plutonium from PUREX.

- A team investigating the threat posed by ferrocyanide in about two dozen of Hanford's tanks concludes there is little, if any, near-term likelihood of an explosion. The team recommends Westinghouse conduct additional temperature monitoring of the affected tanks.

- Saying he has peaked in government service, Mike Lawrence resigns as Hanford Manager. Many speculate he was forced out as a result of Admiral Watkins' unhappiness with Lawrence's blunt discussion of Hanford risks.

"Mike's willingness to open some of the old closets and let the skeletons out got him in trouble with some folks."

– Washington Congressman Sid Morrison. (Tri-City Herald, July 7, 1990).

"The loss of Mike Lawrence is a substantial one....most important, he was and is trusted....The errors of the past...came to light at least in part because of his work within government to make them available."
– (Tri-City Herald Editorial, July 7, 1990).

- The Hanford Education Action League releases a study urging that PUREX remain shut down. The report said restart of the plant is unsafe, environmentally dangerous, and expensive.

"Saying that plutonium production at PUREX is needed for environmental cleanup is like saying we need crack houses to fight drug addiction."

– Scott Saleska, co-author of the HEAL study. (Tri-City Herald, July 11, 1990).

- John Wagoner, Deputy Manager at DOE's Savannah River Site, is appointed interim Hanford Site manager. DOE also announces the creation of three new deputy manager positions at Hanford and says Wagoner will report directly to Leo Duffy, director of DOE's waste management and environmental restoration programs. The changes make Hanford management less autonomous and more accountable to DOE Headquarters.

"Today we still have a management regime that is largely based on production of special nuclear materials. That is not our goal out there anymore."

– Energy Secretary James Watkins. (Tri-City Herald, July 12, 1990).

- The independent scientific panel directing studies into past releases of radioactive materials from Hanford issues results from the first phase of its study. The results show thousands of Northwest residents may have been exposed to radioactive materials released from Hanford between 1944 and 1971. The panel supports a thyroid epidemiological study.
- Energy Secretary Watkins announces his master plan for producing nuclear weapons into the middle of the next century. Hanford is not initially considered to be a favorite to host any facilities as part of "Complex 21."
- Preliminary findings from the Tiger Team investigation at Hanford show low morale and a lack of management oversight. The report concludes that while management and safety practices are improving, numerous problems still exist.

"The overall assessment is that the Hanford Site is on a positive improvement slope, but far from achieving expectations or excellence." DOE "is not aggressive enough in directing the contractors to identify and resolve important safety and health issues." – Tiger Team Draft Report. (Tri-City Herald, July 19, 1990).

- A DOE report shows Hanford contractors have known about hydrogen in the tanks for 13 years, but have done nothing to resolve the problem. The report concludes that management actions necessary to ensure an adequate level of safety are lacking.

August 1990

- Energy Assistant Secretary Leo Duffy tells a Senate Committee that DOE is re-evaluating its schedule for a high-level waste vitrification plant at Hanford.



Energy Assistant Secretary Leo Duffy.

- Jars of slightly radioactive mulberry jam are shipped to Governor Gardner and Secretary Watkins. The mulberries were picked near N Reactor and contained strontium 90.

"This mulberry jam is a token of the future hazard of unidentified, uncontained and unmanaged radioactivity at Hanford."
– Letter from Norm Buske (who picked the mulberries and made the jam) to Governor Gardner and Secretary Watkins. (Tri-City Herald, August 8, 1990).

- In testimony before Oregon Senator Mark Hatfield, who is conducting a hearing in Pendleton, the state of Oregon formally opposes restart of PUREX.

September 1990

- Energy Assistant Secretary Leo Duffy, in a visit to Hanford, promises the Tri-Cities that Hanford's mission will continue beyond the 30 years of cleanup.

"What other business do you know of that comes with a 30 year guarantee and a minimum \$25 billion investment?"
– Energy Assistant Secretary Leo Duffy. (Tri-City Herald, September 12, 1990).

- Energy Assistant Secretary Duffy tells state officials that tank safety issues may delay construction and operation of a vitrification plant to treat Hanford's tank wastes.

"This is the first direct statement from a top-level DOE official where they said

they're going to miss a major milestone."
– Terry Husseman, Ecology Assistant Director. (Tri-City Herald, September 16, 1990).

- Westinghouse Hanford President Roger Nichols tells nearly 9,000 Westinghouse employees it's time to stop thinking of Hanford cleanup as "suck, muck and truck." He encourages workers to take pride in their past accomplishments in the nation's defense, but also to acknowledge those days are over.

"We can't make headway in restoring the physical environment unless we restore the mental environment first."
– Westinghouse Hanford President Roger Nichols. (Tri-City Herald, September 25, 1990).

October 1990

- The carcasses of 828 dead beagles are shipped to Hanford for burial. They were part of a study on radiation exposure effects at the University of California at Davis.

"They're no longer cute little dogs, they're just a radioactive waste problem."
– Bern Shanks, UC-Davis. (Tri-City Herald, October 16, 1990).

- DOE officials say tank A-105 may have leaked more than 1,000,000 gallons of contaminated water into the ground over a nine or ten year period starting about 1968. DOE contractors added hundreds of thousands of gallons of water to the tank to cool hot radioactive sludge in the bottom. That water leaked out of a ruptured tank seam. Previous leak estimates for the tank had been about 5,000 gallons.

Hanford's leaking waste tanks

Hanford's first underground waste storage tanks were built in 1944. They were expected to last from 10-20 years. Within that time period – in 1956 – the first tank leak was suspected. The leak, an estimated 55,000 gallons from tank U-104, was confirmed in 1959. By the late 1950s to early 1960s, several tanks were confirmed leakers. Despite other confirmed tank leaks in the following years, it was not until November 1980 that a ban on adding new waste to the single shell tanks was put in place.

Tank leaks are discovered through one of three methods – monitoring wells, leak detection systems and drops in the waste level in the tanks. None of the methods has proven completely reliable.

In all, 67 single shell tanks have been declared or suspected of leaking. Some tanks have leaked more than once. The total amount of waste leaked is estimated at just over 1,000,000 gallons of high-level waste.

To reduce the threat of tank leaks, DOE began to drain as much liquid as possible from the single shell tanks, and move it into the double shell tanks. None of the double shell tanks has yet leaked. Moving liquids out of the single shell tanks is called interim stabilization. A tank is considered interim stabilized when it contains less than 50,000 gallons of drainable liquid and less than 5,000 gallons of liquid floating on top of the waste. By mid-2004, only a few single-shell tanks remained to be interim stabilized.

- DOE says it will prepare a supplemental Environmental Impact Statement (EIS) to determine potential environmental impacts from Hanford's tanks. Energy Secretary Watkins says the action should not be misconstrued as an indication of increased risk to the public – but a confirmation of DOE's commitment to protect the environment.

"The 1987 EIS did not consider the possibility – however remote it might be – of an incident resulting from hydrogen accumulation in certain tanks."

– Energy Secretary James Watkins.

(DOE News Release, October 9, 1990).

- A General Accounting Office report says the consequences of a tank explosion caused by ferrocyanide would be considerably more severe than DOE estimates. While the report agrees the risk of an explosion is low, it concludes that not enough is known about the waste in the tanks to rule out the possibility of a spontaneous explosion.

"If an explosion did occur...it would be a major accident, with...contamination of large areas within and possibly beyond the Hanford Site boundaries. The force of this explosion would blow a large hole in the tank top and its overburden of earth."

– GAO Report. (GAO/RCED-91-34, October 1990).

- The Defense Nuclear Facilities Safety Board says DOE and its contractors are not moving fast enough to address tank safety issues. The DNFSB says DOE's actions do not reflect the urgency the circumstances merit. The Board recommends DOE take immediate steps to add instruments to the single-shell tanks containing ferrocyanide to establish whether hot spots exist or may develop. DOE is also advised to determine if flammable gas is present in the tanks. DNFSB also recommends DOE greatly accelerate sampling of the tanks.

"The proposed schedule...is seriously inadequate in light of the uncertainties as to safety of these tanks." DNFSB Recommendation 90-7. (October 11, 1990).

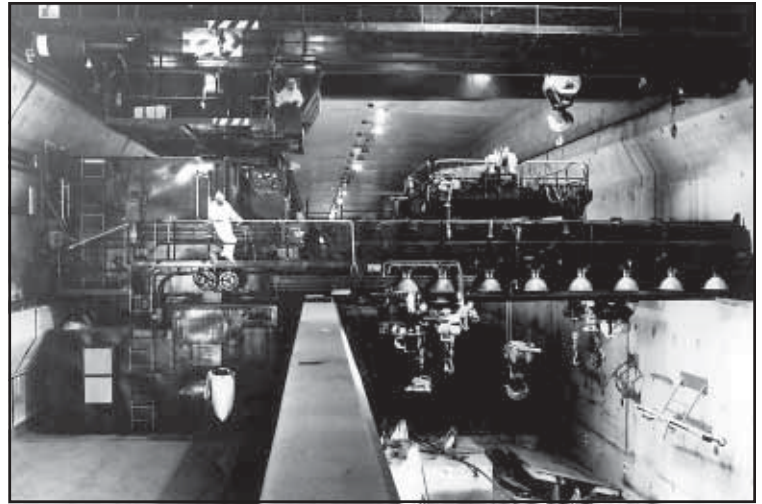
- Westinghouse says at least 780,000 gallons of waste were added to tank SX-108 in 1963 and 1964 and another 150,000 gallons of cooling water added to the tank between 1963 and 1967, even though the tank had leaked in 1962. All remaining liquids were pumped out of the tank in 1980.

- Energy Secretary Watkins, in a joint announcement with Oregon Senator Mark Hatfield, says PUREX will not reopen for further production of weapons grade or fuel grade plutonium. Watkins says the plant will be placed on standby for at least two years while DOE studies whether PUREX should be restarted to process N Reactor fuel stored in the K-Basins. Other options for treating and disposing of the K-

October 1990 continued

Basin fuel will also be examined in an Environmental Impact Statement.

- During a visit to Hanford, Energy Secretary Watkins says Hanford employment will increase from 14,000 to 15,000 in the next two years as cleanup work increases. He also meets with Governor Gardner and announces plans for accelerated cleanup of three sites.
- DOE announces it will conduct a Programmatic Environmental Impact Statement to examine planned environmental restoration and waste management operations throughout DOE's nuclear weapons production complex. The Programmatic EIS will specifically address long-term goals and issues summarized in DOE's five year plan.
- In a letter to Energy Secretary Watkins, Oregon Hanford Waste Board Chair William Schroeder and Vice Chair and Secretary of State Barbara



The PUREX canyon.

Roberts request DOE immediately begin a thorough study of any environmental or public health and safety impacts on Oregon from a tank explosion.

- DOE Headquarters orders a stop on coring work inside Hanford's tanks. Experiments indicate drill bit temperatures could reach 475 degrees Celsius, well above the temperature needed to create a fire in the tanks under certain conditions.

NEPA

The National Environmental Policy Act (NEPA) was passed by Congress in 1969 and requires federal agencies to evaluate potential environmental impacts associated with their activities. If an action is expected to have significant impacts on the environment, NEPA requires development of an Environmental Impact Statement, or EIS. The EIS process requires analysis of potential impacts from an agency's proposed action, as well as the potential impacts from options other than the proposed action. The EIS process is intended to promote public awareness at the earliest planning stages, and to provide opportunities for the public to provide input. NEPA requires a federal agency to update an EIS if significant new information relevant to environmental concerns becomes available regarding that agency's proposed action.

An EIS often takes several years to conduct and costs millions of dollars. Since 1989, many site-specific EISs were conducted at Hanford. DOE also conducted a number of EISs to evaluate activities throughout the entire nuclear weapons production complex.

November 1990

- Westinghouse Hanford Company demotes and suspends a manager and suspends another employee after the intentional disabling of a remote radiation alarm indicator at T Plant.
- Westinghouse Hanford Company announces a reorganization and the establishment of an internal Tiger Team.
- Samples are taken from the crust inside tank SY-101. The crust is found to be damper, softer and less radioactive than expected.

December 1990

- Further analysis of crust samples from tank SY-101 show the crust contains up to 25 percent water and may be too wet to burn.
- Hanford Manager John Wagoner notifies Ecology in writing that technical and programmatic concerns may delay the start of construction of the vitrification plant.

- A “Watch List” is created to monitor the tanks at Hanford which pose immediate safety risks.
- Four Westinghouse Hanford workers are suspended after tampering with a tank farm safety alarm. Later, a Westinghouse Hanford employee resigns after tampering with an air monitor.
- DOE announces plans to spend \$25 million over the next four to five years to replace outdated safety monitoring instruments and alarms at most of the tanks.

“I don’t know why the tank farms had a low priority. But they did not get the attention or the budgeting the rest of the site did.” – Phil Hamric, Hanford Deputy Manager. (Tri-City Herald, January 31, 1991).

- Energy Secretary Watkins, in a letter to Washington Governor Gardner and EPA Regional Administrator Dana Rasmussen, announces plans to delay major Hanford clean-up projects. The delays of two years or more affect the vitrification plant and a pre-treatment plant. Governor Gardner threatens legal action.

“It’s astonishing that Energy would unilaterally let such a major milestone slip. The (Tri-Party) agreement is very clear: changes are to be proposed and discussed out in the open, and not pulled like a rabbit out of a hat.” – Dana Rasmussen, EPA Northwest Regional Administrator. (EPA News Release, January 31, 1991).

- A Westinghouse Hanford Co. report concludes that Hanford’s waste storage tanks do not contain “red oil,” an organic-based material that could potentially detonate at relatively low temperatures.

Watch list

Beginning in 1989 and continuing into the early 1990s, a series of concerns were raised about the potential for wastes in some of Hanford’s tanks to ignite or explode. It was feared an explosion or fire inside a tank could cause the dome to collapse and provide an outlet for radioactive materials to reach the environment.

In 1990, Congressman (now Senator) Ron Wyden of Oregon successfully proposed legislation that created a “Watch List” of tanks. Tanks on the Watch List require special safety precautions because of the potential for a fire or explosion. The Watch List was created in January 1991. There were four issues of concern: hydrogen, ferrocyanide, organics and high heat.

- hydrogen is generated through chemical reactions in the tank waste. At certain concentrations, hydrogen is flammable. At higher concentrations it is explosive.
- about 350 tons of ferrocyanide were added to two dozen tanks in the early 1950s to separate cesium from the waste. Under high temperatures and at certain concentrations, ferrocyanide can explode.
- more than five million pounds of organic chemicals were added to the tanks, mainly as a result of efforts to remove strontium from the wastes. At certain concentrations and at certain temperatures, organics can ignite.
- radioactive decay in the waste can create temperatures great enough to cause the waste to boil. If the tank were to leak, adding cooling water would increase leakage to the soil. If cooling water was not added, the waste could heat enough to cause structural damage to the tank, possibly leading to a large release to the environment.

In all, 52 tanks (47 single shell and five double shell) were on the initial Watch List. Some tanks were on more than one list. A few additional tanks were added to the Watch List later in 1991, in 1992, 1993 and 1994. No tanks were added to the Watch List since May 1994.

Hanford workers resolved each of the tank safety issues and the Watch List was closed in August 2001.

February 1991

- DOE releases results of a study to define the nation's nuclear weapons production needs well into the next century. Energy Secretary Watkins says the new complex will be smaller, less diverse and less expensive to operate. Production activities at Rocky Flats, Colorado will end. Costs of the new complex are estimated at \$6.7 to \$15.2 billion. Hanford is one of five sites listed as a potential new production site, although DOE officials say Hanford is not their first choice.
- A study by the Congressional Office of Technology Assessment shows cleanup of DOE's nuclear sites may take much longer than 30 years.

"In many instances, certain waste and contamination now present at DOE sites...will probably remain there considerably beyond the year 2019." – Office of Technology Assessment report. (Tri-City Herald, February 11, 1991).

- The first Superfund cleanup work begins at Hanford. The project is to recover about 100 steel drums containing toxic chemicals and uranium from a 300 Area burial site, less than one mile from the Columbia River.
- EPA officials urge DOE to accelerate efforts to stop seven liquid waste streams.

March 1991

- A Westinghouse Hanford official says the delay in the high-level vitrification plant may be significantly longer than two years. Technical, safety and budget issues are blamed.
- Energy Secretary Watkins, while testifying at a House subcommittee hearing, says continued disputes with the state of Washington are likely over cleanup schedules.

"We are not trying to drag our feet...But we have to wean ourselves of the notion that we can clean it up by throwing money at it." – Energy Secretary James Watkins. (Tri-City Herald, March 7, 1991).

- DOE announces plans to publish a report explaining the history behind all of Hanford's 1,400 waste sites.

"People may be shocked by the volume of wastes." – Ron Gerton, DOE. (Tri-City Herald, March 12, 1991).

"My guess is that the public probably wasn't aware that tank wastes were discharged into the soil." – Paul Day, EPA. (Tri-City Herald, March 12, 1991).



Hanford's B Plant.

- Ecology Director Christine Gregoire asks for help from the state's Congressional delegation to get DOE to drop plans to use B Plant for pre-treatment. Gregoire said B Plant can never comply with hazardous waste laws.
- DOE and Westinghouse release a list of 27 tank safety problems, including the four issues which resulted in creation of the Watch List. Other problems include a lack of available tank space, a lack of accurate information about the tank contents and aging leak detection and alarm systems.

April 1991

- Washington Department of Ecology officials join EPA in demanding severe restrictions on liquid discharges to Hanford's soil.
- Ecology and EPA officials write to Hanford Manager John Wagoner, rejecting DOE plans to delay construction of a high-level waste vitrification plant. The regulators did agree to delays in pumping liquids from the single shell tanks because of safety issues.
- DOE announces that 444 billion gallons of contaminated liquids were dumped into the soil at Hanford since operations began in 1944. It was the first attempt to estimate the total volume of radioactive materials and chemicals

dumped or buried at Hanford. The waste discharges are estimated to have contained about 678,000 curies of radioactivity and 93,000 tons of chemicals. About 121 million gallons of tank waste were dumped to the soil.

"The report re-emphasizes that the contamination at Hanford far exceeds what anyone thought it was, and that cleanup is going to be a lot bigger."

– Lynn Stemberge, Hanford Education Action League. (Seattle Post-Intelligencer, April 13, 1991).

May 1991

- Agreement is reached on revisions to the Tri-Party Agreement. They are the first changes since the agreement was signed two years ago. Among the major changes – the start of construction of the vitrification plant will be delayed by 10 months to April 1992, but the operational date of December 1999 remains the same; up to four new double shell tanks may be constructed to allow more flexibility in handling high-level waste; increased involvement by Ecology and EPA in preparing Hanford's annual funding estimates; and a delay in pumping liquids from the single shell tanks. A strategy to streamline cleanup is also agreed to in which

the schedule for investigating and developing alternatives for old waste sites is reduced from seven to nine years, to three to four years.

- After a venting of hydrogen in tank SY-101, new core samples are taken from the tank and a video camera and light are installed to monitor activity inside the tank. A radar device is also installed to track the level of waste in the tank.
- A Westinghouse Hanford report shows 75 containers of spent fuel rods were placed in a low-level burial site in the mid-1970s.

June 1991

- DOE officials say the amount of plutonium in Tank C-104 exceeds safety limits. The concentration of plutonium is still low enough that a criticality is not likely.
- DOE awards a two year contract extension to Westinghouse Hanford Company and announces changes in site management, including the addition of a separate contractor to manage environmental restoration work.

- A GAO report says DOE should cancel \$609 million in projects designed to make B Plant a waste treatment facility. The report says B Plant does not meet today's regulatory standards and the state is unlikely to waive these standards.

GAO

The General Accounting Office (GAO) is the investigative arm of Congress. Charged with examining matters relating to the receipt and disbursement of public funds, GAO performs audits and evaluations of Government programs and activities.

The GAO is under the control and direction of the Comptroller General of the United States, who is appointed by the President with the advice and consent of the Senate for a term of 15 years.

GAO's work is done at the request of congressional committees or members, or to fulfill specifically mandated or basic legislative requirements. GAO's findings and recommendations are published as reports to congressional members or delivered as testimony to congressional committees.

GAO's staff has expertise in a variety of disciplines. When an assignment requires specialized experience not available within GAO, outside experts assist the permanent staff.

From 1989-2004, GAO conducted dozens of audits related to DOE's nuclear weapons cleanup program, and many specifically related to Hanford cleanup.

July 1991

- Westinghouse announces it has successfully demonstrated the ability to extract carbon tetrachloride from the soil. The demonstration is part of an expedited cleanup action. The full scale project is expected to get underway in September. More than 2 million pounds of carbon tetrachloride were discharged to the ground near the Plutonium Finishing Plant between 1955 and 1973. The chemical has since spread over a seven square mile area of the soil and groundwater. The vapor extraction process is designed to intercept the chemical before more of it reaches the groundwater.
- A DOE report says Hanford's double shell tanks could start leaking before DOE is able to remove wastes from the tanks for treatment and vitrification. The report says the oldest of the

double shell tanks are fast approaching the limit of their expected operating life.

- A survey conducted for the Tri-Party agencies shows Washington and Oregon residents are interested in cleanup work at Hanford, but many doubt whether they actually have any input in the cleanup decisions. Sixty three percent of the poll respondents said they did not believe Hanford officials were interested in public participation in Hanford cleanup decisions. About 51 percent said they were very, or somewhat interested in helping make decisions about Hanford.

- DOE officials say they cannot pump the contents of Tank C-106 if it begins to leak. Their only option is to add water to keep the temperature of the waste from getting too high.

Adding water to the tank, if it is leaking, would drive the waste towards the groundwater. DOE will develop a new contingency plan by December.

- More than one hundred protesters demonstrate against a proposal to consolidate nuclear weapon production facilities at Hanford as part of DOE's Complex 21 plans. It is the largest anti-nuclear protest at Hanford in years.



Carbon tetrachloride vapor extraction system.

August 1991

- Employment at Hanford reaches a record 15,076 workers.
- Energy Secretary Watkins says N Reactor will be permanently shut down.

*"I have determined that it is no longer necessary to continue preservation of N Reactor as a contingency for the production of defense nuclear materials."
– Energy Secretary James Watkins.
(DOE News Release, August 14, 1991).*



Hanford's N Reactor.

Hanford Site Employment

Fiscal Year 1989	12,700
FY 1990	14,000
FY 1991	15,000
FY 1992	16,100
FY 1993	17,300
FY 1994	19,200
FY 1995	15,200
FY 1996	14,100
FY 1997	10,700*
FY 1998	10,100*
FY 1999	10,400
FY 2000	10,900
FY 2001	12,000
FY 2002	13,700
FY 2003	12,700
FY 2004	12,600

*These figures do not include employment at the Enterprise Companies.

September 1991

- Hanford's updated Five Year Plan lists the threat of a fire or explosion in the underground waste tanks as the Site's top concern. Resolution of tank safety issues is listed as DOE's highest priority at Hanford.
- DOE announces a one year delay in opening the high-level waste vitrification plant at the

Savannah River Site. It is now scheduled to open in December 1993.

- After a year's delay because of tank safety issues, Westinghouse starts taking samples from the single shell tanks to gain a better understanding of the waste contents.

October 1991

- Empty barrels marked "radioactive" and some also marked "Hanford" are discovered in the Columbia and Willamette Rivers. The ten barrels are found near downtown Portland and

near Rainier, 45 miles down river. The barrels are empty, and are apparently some type of protest. No one claims responsibility.

November 1991

- The Advisory Committee on Nuclear Facilities Safety (known as the Ahearne Commission, after its chair, John Ahearne), issues its final report. The report says worker safety at the tank farms remains an issue and DOE should not create new environmental restoration management contractors at Hanford or at other DOE sites. It also said DOE's goal to clean up the nuclear weapons complex by 2019 is "unattainable."

"The methodology appears to be scientific and unbiased, but in fact it is not... There is only the illusion of scientific certainty and objectivity." – Final Report of the

Advisory Committee on Nuclear Facilities Safety, referring to DOE's method of setting budget priorities for cleanup. (Tri-City Herald, November 11, 1991).

- An internal DOE study suggests delays in Hanford's high-level waste vitrification plant may be unavoidable.
- Energy Secretary Watkins announces a seven point American Indian policy. Among the commitments is a pledge for prior consultation with tribes where their interests or treaty rights might be affected by DOE activities.

Native American interests

Several Native American tribes have traditional claims to the Hanford Site. For hundreds of years, Native Americans fished, gathered food, and conducted religious ceremonies throughout the area now called Hanford. These traditional rights are protected by treaty.

Hanford's involvement with Native American Tribes is guided by DOE's American Indian Policy. That policy states among other things that, "The Department will consult with any American Indian... tribal government with regard to any property to which that tribe attaches religious or cultural importance which might be affected by a DOE action." Native American Tribal Governments have a special government-to-government relationship with the federal government as defined by treaties, statutes, court decisions and the Constitution.

In recognition of this relationship, Hanford officials consult with Tribal staffs for recommendations and advice on DOE activities potentially affecting tribal rights and interests. Three Northwest tribes are recognized by Congress as being affected by Hanford operations. The Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Yakama Indian Nation all have rights recognized and guaranteed in the Treaties of 1855. The Wanapum, who still live adjacent to the site, are a non-federally recognized tribe who also have strong cultural ties to the site. The Wanapum are consulted on cultural resource issues.

Tribal people routinely access portions of Hanford for traditional religious practices, including the gathering of foods and medicines.

December 1991

- John Wagoner is named Manager of the Hanford Site. He has been serving in an acting capacity for 17 months.
- DOE drops plans to use B Plant for pretreatment of Hanford's tank waste.



Hanford Site Manager John Wagoner (on right).

January 1992

- A survey by the Hanford Reach newspaper shows some workers are still afraid to raise safety concerns. About 20 percent of the respondents say they do not believe they can raise safety concerns without suffering some retaliation.
- DOE releases a report detailing 127 significant accidents at Hanford, many of which had previously been made public. Fourteen of the 127 accidents are considered Category 1, the most serious. These involved serious injury, radiation release or exposure above limits, substantial damage or more than \$1 million in damage. Four of the Category 1 accidents involved reactor operations, seven were related to chemical processing, and three to laboratory or experimental operations. Chronic or repetitive radioactive material releases are generally not included in the report.
- The Bush Administration requests a \$1.7 billion Hanford budget for fiscal year 1993. It would represent a 17 percent increase over the current budget, and allow the vitrification plant to remain on schedule for a 1999 startup.

February 1992

- Ecology officials reject DOE's plans to use commercial laboratories for low-level mixed waste sampling, instead of building their own facilities at Hanford. Ecology officials cite delays in getting results – sometimes as long as five to seven months past deadlines. The sampling is needed to support cleanup work.
- In a speech to employees, Westinghouse Hanford President Tom Anderson challenges workers to demonstrate and apply advanced technologies in their cleanup work. He says cleanup is not enough to maintain continued funding.

"No way is the government going to keep spending billions and billions at Hanford over so many years just to clean up some desert land. The government doesn't have a history of sticking with something that long." – Tom Anderson, Westinghouse Hanford President, in a speech to employees. (February 9, 1992)
- Oregon Governor Barbara Roberts charges the Oregon Hanford Waste Board with elevating Hanford issues in Oregonian's minds.

"Our fellow citizens must know the stakes involved in a successful Hanford cleanup, as well as the perils of mistakes." – Oregon Secretary of State Phil Keisling, reading Governor Roberts' charge to the Oregon Hanford Waste Board. (February 18, 1992).

March 1992

- In a letter to Energy Assistant Secretary Leo Duffy, John Wagoner asks for permission to permanently close PUREX.
- DOE orders the Fast Flux Test Facility into a standby mode, effective April 1. The reactor is already scheduled for shutdown for routine maintenance and refueling.



FFTF control room.

April 1992

- The Hanford Future Site Uses Working group conducts its first meeting.

"How clean is clean? What gets cleaned first? What is the land going to be used for? When you tackle the big problems like this, you've got to answer these questions." – Randy Smith, EPA. (Tri-City Herald, April 3, 1992).

- A Hanford worker, Miles Fisher, is killed when he plunges through the roof of F Reactor and falls 50 feet to a concrete floor.

- EPA fines DOE \$100,000 for missing a cleanup deadline related to operation of an on-site analytical laboratory.

- DOE releases a request for proposal for an environmental restoration management contractor, despite strong opposition from local governments, labor unions and the state's congressional delegation. The proposal includes \$185 million for environmental restoration work at Hanford in 1993.

Future Site Uses Working Group

The Hanford Future Site Uses Working Group was charged with identifying a range of possible future uses for the site, and to help advise cleanup activities to make those potential uses possible. The nine month planning effort involved 28 parties, including DOE, its regulators, the Yakama and Umatilla tribes, the state of Oregon, environmental groups, agriculture, labor, economic development and others. The group met nine times from April 1992 through December 1992.

The Working Group members agreed they would not seek consensus on a single vision for future site use and cleanup strategies. Instead, they suggested several potential uses for each of six geographic areas of the site. The Working Group also agreed on a common set of values to guide cleanup.

This process resulted in greater public participation in Hanford decision making.

May 1992

- Groundbreaking ceremonies are held to mark the beginning of construction of a high-level waste vitrification plant.
- Ecology officials announce that major monitoring systems at SY-101 do not work or are not reliable. The state writes a notice of violation,

which says a leak from the tank could go or may have gone undetected for an extended period of time. Ecology inspectors found one leak detection device to be virtually useless, a second that has been malfunctioning since August, and a third with radiation detectors that don't work.

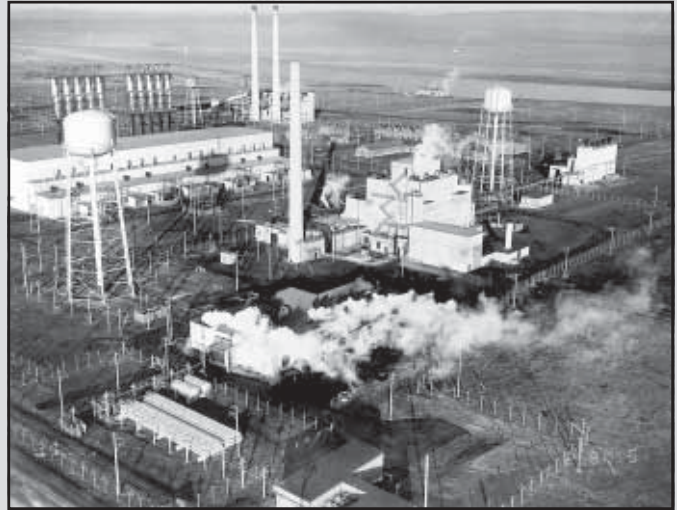
June 1992

- B Reactor is listed on the National Register of Historic Places.
- A plane crash near the Yakima Firing Range kills Battelle scientists Richard Fitzner and Lester Eberhardt and their pilot.

Hanford's reactors

The U.S. Government built nine nuclear reactors at Hanford to produce plutonium for its nuclear weapons program. All nine were built along the Columbia River at the north end of the Hanford Site.

Hanford's first reactor, B Reactor, began operation in September 1944. Two other reactors began operations during World War II, D Reactor in December 1944, and F Reactor in February 1945. A major expansion began in late 1947. Five more reactors went on line between October 1949 and April 1955. The last of Hanford's plutonium production reactors, N Reactor, began operations in December 1963. In addition to producing plutonium for nuclear weapons, N Reactor also produced steam to generate electricity.



Hanford's B Reactor.

In 1964, because of a surplus of plutonium, the government began to shut down the reactors at the rate of about one per year. By January 1971, only N Reactor was still operating. N Reactor was shut down in 1987.

DOE plans to eventually dismantle eight of the reactors. It plans to make B Reactor an historic site and museum.

July 1992

- A GAO report criticizes existing soil monitoring programs at Hanford and says DOE needs to improve and integrate these programs. The report says studies of the vadose zone are critical to the success of cleanup.

"Existing programs receive limited funding, operate with out-of-date and uncalibrated equipment, and are not comprehensive enough to assess the migration of contaminants from tanks or in the ground." – GAO Report. (GAO/RCED-92-149, July 1992).
- A DOE review of Hanford's tank farm operations concludes that the condition of the tank farms is poor and continues to deteriorate. It also concludes Hanford workers do not have equipment readily available to quickly respond to a tank leak.
- A Defense Nuclear Facilities Safety Board report says many safety problems remain at Hanford's tank farms.

Vadose zone

The vadose zone is the area between the earth's surface and groundwater. At Hanford, the vadose zone extends between one and 350 feet in depth.

Over more than half a century, billions of gallons of contaminated liquid waste was dumped into the soil at Hanford into nearly 300 waste disposal sites. These include trenches, ponds and cribs (underground structures designed to allow liquid waste to percolate to the soil). In addition, at least 67 of Hanford's underground waste storage tanks leaked a million gallons or more of highly radioactive waste into the soil. Most of this contamination remains in the vadose zone, although the groundwater is also extensively contaminated. The full extent of the vadose zone contamination is unknown. Hanford officials have begun a process to better understand the extent of vadose zone contamination.

July 1992 continued

"The existing tank farm operator training program consists of little more than the passing of 'tribal knowledge,' both good and bad, from senior operators to junior operators." – DNFSB Report. (Tri-City Herald, July 25, 1992).

- DOE announces it is stepping up internal oversight of Hanford. The action is in response to a DOE Headquarters audit which showed Hanford management hasn't met Tiger Team recommendations that DOE officials spend more time on the site.



Worker at a Hanford tank farm.

August 1992

- Westinghouse announces five new projects for accelerated cleanup. Accelerated cleanup projects can bypass some studies required by federal environmental cleanup laws. Two earlier accelerated cleanup projects have been completed while a third is underway.
- Construction is underway to expand Hanford's hot cell capabilities. Five analytical hot cells are

being added, which are needed to keep up with cleanup. Schedules call for analysis of 2,000 samples a year after the mid-1990s.

- Leo Duffy, Energy Assistant Secretary for Environmental Restoration and Waste Management, announces his resignation, effective at the end of the year.

September 1992

- A large venting of hydrogen occurs at tank SY-101, one of the largest in the tank's history. Waste levels in the tank drop 10 inches in 10 minutes, and a pipe which held instruments to measure temperatures in the tank is severely bent.



Hanford's T Plant.

"There was substantial movement. You could see waves bouncing off sides." –Melissa Rodewalk, Westinghouse spokeswoman, referring to the view inside the tank via video camera. (Tri-City Herald, September 4, 1992).

"We aren't in control of the tank, it's kind of in control of us." – Phil Hamric, Hanford Deputy Manager, referring to tank SY-101. (Tri-City Herald, October 10, 1992).

- Ecology gives DOE two months to bring T Plant into compliance with environmental regulations. Ecology inspectors find numerous small violations at the plant, but none that pose an immediate threat to the public. T Plant is used to decontaminate equipment from around the site.

October 1992

- A 7,000 gallon leak from tank T-101 goes unreported for four months because tank farm workers don't trust a malfunctioning leak detection device. Tank T-101 is declared Hanford's 67th leaking tank.
- A Los Alamos National Laboratory study concludes "red oil" does not likely exist in Hanford's waste storage tanks and therefore does not pose a hazard. Red oil is an organic-based material that can potentially detonate at relatively low temperatures. The report recommends further study to better understand the behavior of red oil in complex chemical environments such as Hanford's waste tanks.
- President Bush signs the Federal Facilities Compliance Act of 1992. The law requires DOE to bring Hanford and other defense sites into compliance with hazardous waste laws.
- Westinghouse workers successfully remove a bent pipe from tank SY-101.

Federal Facilities Compliance Act

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA), to regulate the safe and proper handling, storage, treatment and disposal of hazardous wastes. RCRA allows states to assume responsibility for the administration and application of RCRA within state borders.

RCRA and Washington state's hazardous waste law are the basis for Washington's regulatory oversight of Hanford cleanup. However, Washington's efforts to ensure compliance with RCRA and its hazardous waste law were often frustrated at Hanford, as DOE claimed sovereign immunity and successfully blocked state enforcement action.

After more than four years of debate and negotiation, Congress passed in late 1992 the Federal Facilities Compliance Act. Passage of this act had been a long-standing priority for Washington and Oregon. The Federal Facilities Compliance Act in effect subjects DOE (and other federal agencies) and its contractors to nearly the same enforcement sanctions under RCRA and state hazardous waste laws as any other private party or non-federal government entity. The law makes it clear that federal sovereign immunity is not a bar to enforcement and civil penalty action by state and federal regulators. While there are some exceptions, the law strengthens the ability of the states and the U.S. Environmental Protection Agency to enforce compliance agreements.

November 1992

- A DOE audit shows numerous hazards at Hanford's surplus buildings. Hazards include improperly marked radiation zones, unmarked drums of hazardous chemicals and rattlesnakes.
- site – with special nuclear materials.”*
– Robert Rosselli, DOE Assistant Manager for Administration. (*The Oregonian*, November 16, 1992).

- The Oregonian reports that a 1979 internal report acquired through the Freedom of Information Act shows some sites at Hanford were vulnerable to sabotage and potential theft of plutonium. The internal report said N Reactor was particularly vulnerable to an attack. Hanford officials insist no plutonium could have been stolen.

“Our protective scheme is such that no one's ever going to get off of this site – and I'm saying 'ever' get off of this

“It's a positive stroke that the system is working. We didn't find our vulnerabilities by an adversary thwarting us. We found our vulnerabilities because we were our own worst critics and we've taken action.”
– James Spracklen, DOE's Acting Director of Safeguards and Security at Hanford. (*The Oregonian*, November 16, 1992).

November 1992 continued

- Ecology gives DOE 30 days to develop a schedule to resolve problems at tank T-101, which was declared a leaker in October.
- The Yakama Indian Nation says the needs of Native Americans should be considered first in deciding future uses of Hanford's land.

"We used every aspect of the Hanford Reservation. We depended on the foods and the medicines, not only from the land, but from the river." – Russell Jim, Yakama Indian Nation. (Associated Press, November 18, 1992).

December 1992

- DOE and Westinghouse agree to a new two year contract for Westinghouse to manage the Hanford Site.
- Energy Secretary Watkins announces the permanent closure of PUREX.
- DOE officials conclude they cannot have a facility ready to store nuclear waste from the nation's commercial nuclear power plants by a 1998 deadline, and announce they will search military bases and nuclear weapons production sites for temporary storage sites.
- The Hanford Future Site Uses Working Group report is released to the public. It includes nine major recommendations related to Hanford cleanup. These include: protect the Columbia River; do not cause additional harm through cleanup work or future development; restrict access to the 200 Area for at least 100 years after cleanup is complete; and place a priority on cleaning up those parts of the site which have high value for future use. The Working Group suggests a range of future use options exist for most areas of the site.

"It surprised a lot of people that we could work together so well and come up with an agreement." – Gerald Pollet, Heart of America Northwest. (Tri-City Herald, December 23, 1992).

"I wasn't necessarily expecting a food fight, but I did think it would be difficult to come up with general findings, and that turned out not to be the case." –Mark Drummond, President of Eastern Washington University and Chair of the Group. (Tri-City Herald, December 23, 1992).



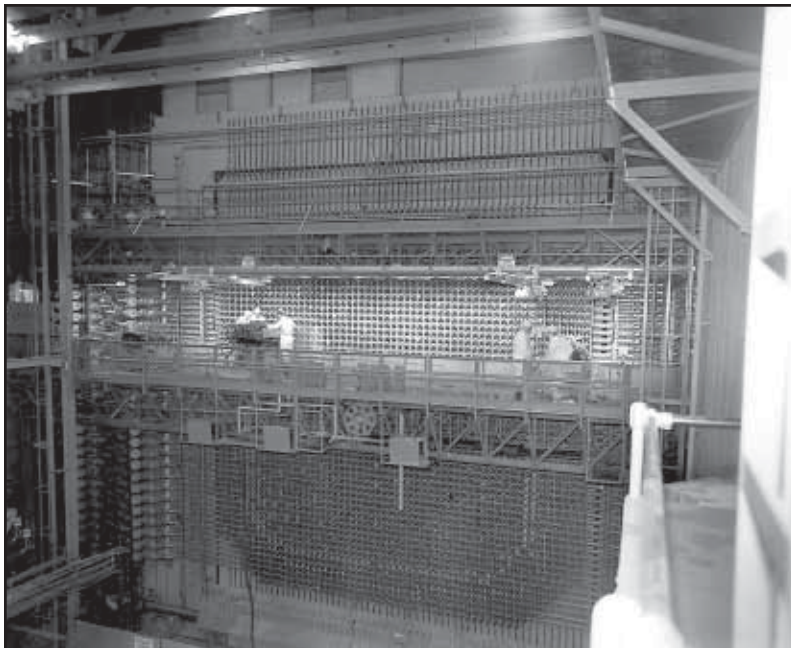
Inside PUREX.

January 1993

- DOE reverses its decision, and will keep Kaiser Engineers Hanford Co. as its engineering and construction services contractor.
- DOE announces its preferred alternative for eight of Hanford's nine reactors. The plan calls for dismantling the reactors, moving them away from the Columbia River, and burying them on site. This would be done within 30 years.
- Energy Secretary Watkins notifies Washington Senator Slade Gorton that FFTF will be moved from "hot" to "cold" standby beginning in mid-February. Watkins says there is no mission for the reactor. In cold standby, the reactor will be defueled and its sodium coolant removed and stored. The process is expected to take five years.

"There no longer is any basis to maintain FFTF in a hot standby status. The cold standby status will permit further cost savings without losing the option of future operations." – Energy Secretary James Watkins. (DOE News Release, January 11, 1993).

- DOE issues its newest five year cleanup plan, the final from the Bush Administration. The plan suggests it may be necessary to delay vitrification of Hanford's tank wastes.



One of Hanford's nine plutonium reactors.

- Bechtel Group Inc. is awarded a five year, \$800 million environmental restoration and management contract for the Hanford Site. Bechtel will take over environmental restoration activities from Westinghouse July 1, with a four month transition beginning March 1. The two losing bidders for the contract protest the contract award to Bechtel.

"Our number 1 priority will be to meet or beat the Tri-Party Agreement milestones and make Hanford a model for environmental cleanup." – Ed Keen, President of Bechtel Hanford. (Tri-City Herald, January 16, 1993).

- Hazel O'Leary is sworn in as Energy Secretary as part of President Clinton's cabinet. She was an executive with Northern States Power Company of Minneapolis.
- DOE, EPA and Ecology reach agreement on a plan to pump liquids from tank T-101, which was declared a leaker in October. Liquids in the tank will be pumped to a double shell tank by March 15. Leak detection systems at the tank will also be upgraded.
- DOE, Ecology, the Yakama Indian Nation and others raise concerns about the effectiveness of grout for entombing low-level radioactive waste at Hanford. The concerns include how well the grout will hold up over time and the amount of long-lived radioactive materials that will be in the grout. Early tests showed more heat generated within the grout than had been expected.

"We don't want to put over four million curies in a less-than ideal waste form in the ground at Hanford." – Todd Martin, Hanford Education Action League.

February 1993

- Energy Secretary O’Leary delays shutdown of FFTF while a new review is conducted of its potential use.
- Oregon Representative Ron Wyden says a DOE report on Hanford’s tanks shows the condition of tanks is poor and deteriorating and that one third of the tank monitoring instruments don’t work.
- Plans to install a mixer pump in tank SY-101 are delayed because of high concentrations of hydrogen in the tank.
- A possible leak is discovered in the K-East basin, where spent fuel from the N Reactor is stored. Measurements indicate the basin is losing about 50 gallons of water an hour. The basin leaked for several years in the 1970s and was repaired in 1980.



The K-Basins are located at the K-East and K-West reactors, very near the Columbia River.

- DOE proposes to build a massive landfill to dispose of contaminated soils from Hanford. The landfill will hold up to 30 million cubic yards of waste, and could be ready for operations in 1996. The facility will hold contaminated dirt from trenches, cribs and from along the Columbia River.
- DOE officials say they are considering several possible changes to the schedule to begin high-level waste vitrification at Hanford. One possible scenario will delay the process until 2020.

March 1993

- The Nuclear Regulatory Commission denies a request by Oregon and Washington to oversee the handling and disposal of millions of gallons of Hanford’s radioactive and hazardous waste. The decision comes three years after the states asked the Commission to change its rules and assume jurisdiction over the waste storage tanks.
- DOE and Westinghouse are fined \$100,000 for violating hazardous waste regulations at the tank farms.
- All work at Hanford’s Plutonium Finishing Plant involving plutonium is halted after two contamination accidents within five days.
- A GAO report calls for delay in construction of the Hanford high-level waste vitrification plant and renegotiation of the Tri-Party Agreement. The report says major technical problems exist in all parts of the tank waste cleanup program and unrealistic TPA deadlines may result in DOE spending billions of dollars on a plant that could sit idle for years.

The Plutonium Finishing Plant

Hanford’s Plutonium Finishing Plant (PFP) was built in the late 1940s. The plant was used to convert plutonium liquids and powders into metals and oxides, which were then sent to DOE’s Rocky Flats plant for final machining for use in nuclear weapons. The Plutonium Reclamation Facility, which is part of the PFP complex, was used to reclaim plutonium from scrap materials. In 1990, PFP’s mission was changed to stabilizing and cleaning up plutonium residue.

PFP has the second largest plutonium inventory in the United States. There is an estimated four metric tons of plutonium in PFP’s vaults, and more than 13 metric tons of plutonium-bearing materials that have been stabilized during the past several years for safer long-term storage. These include scrap materials, liquids, metals and oxides.

Stabilizing PFP’s plutonium and cleaning up the facility was a high priority for both DOE and stakeholders.

March 1993 continued

"The desire to hold to deadlines needs to be balanced against the very real possibility that billions of dollars could be spent on a vitrification plant that simply cannot do the job." – GAO Report. (GAO/RCED-93-99, March 1993).

- Energy Secretary O'Leary meets with Washington Governor Mike Lowry and assures him DOE will uphold cleanup agreements. The two

did not discuss a GAO report released two days earlier that recommended major delays in the vitrification program.

- DOE, EPA and Ecology agree to at least a six month delay in the start of construction on the high-level waste vitrification plant. The revision to the Tri-Party Agreement also includes a provision that about half of the site will be cleaned up by October 1994.

April 1993

- A waste storage tank at the Tomsk-7 complex in Russia explodes and causes a fire. The tank contained a uranium solution. DOE officials say the contents of Hanford tanks are different and a similar incident is unlikely at Hanford.
- The pumping of 25,300 gallons of liquids from tank T-101 is completed. More than 100,000 gallons of sludge remain in the tank, which was declared leaking in October 1992. Three million gallons of liquid waste remain to be pumped from 43 single shell tanks.

"Pumping now is an insurance policy against insulting the environment. We'd be in serious trouble if we didn't do it." – Phil Hamric, Hanford Deputy Manager. (Tri-City Herald, April 14, 1993).

- A GAO report says DOE wastes hundreds of millions of dollars in the way it drills monitoring wells at Hanford. The report says efforts should be taken to use more efficient drilling methods.

- A report from DOE's Office of Nuclear Safety says the chance of a disaster at one of DOE's nuclear weapons facilities is high, due to deteriorating equipment, worker sabotage and poor management. Steven Blush, the Office's Director, is removed from his job by Secretary O'Leary after the report is released. O'Leary had previously announced the office would be merged with another.

"There is no doubt DOE's contractors are not performing as they should. People are being injured and contaminated and hazardous materials are being spilled or released into the environment almost every day." – Conclusions from DOE's Office of Nuclear Safety. (Seattle Post-Intelligencer, April 17, 1993).

- DOE and Westinghouse appeal a \$100,000 fine for a waste storage violation. Although they admit the violation did occur, they say the fine should be used to pay for cleanup work and not go into the state's general fund.

May 1993

- Energy Secretary O'Leary announces major new health and safety procedures for DOE. The new procedures allow surprise safety audits at the sites and provide for a three to five year transition to the Occupational Safety and Health Administration for regulating health and safety issues.

- At a Senate Hearing, Energy Assistant Secretary-nominee Tom Grumbly says one of his first priorities after he is confirmed will be to work with state and federal regulators to renegotiate cleanup agreements to make them more realistic.

May 1993 continued

- Energy Secretary O'Leary expresses doubts at a House committee hearing about DOE's ability to meet cleanup deadlines. She suggests some TPA deadlines should be deleted and replaced with a new agreement without commitments.

"We need to take a very hard look...and determine whether we are in a position to truly deliver on all the commitments."

– Energy Secretary Hazel O'Leary. (Tri-City Herald, May 19, 1993).

"Such an approach would leave completion of Hanford tank farm cleanup activities wholly open-ended, and would negate the

(agreement) as an effective and enforceable driver of cleanup work." – Letter from Ecology Director Mary Riveland and EPA Regional Administrator Dana Rasmussen to John Wagoner. (Tri-City Herald, May 19, 1993).

- Hanford officials detect a buildup of plutonium in a filtering system at the K-East basin. The plutonium is estimated at 775 to 1,800 grams, well in excess of the DOE limit of 225 grams. DOE officials say the plutonium is diluted and not likely to cause a criticality accident.
- The Hanford Tank Waste Task Force meets for the first time.

Hanford Tank Waste Task Force

The Hanford Tank Waste Task Force was convened by DOE, EPA and Ecology. The three parties were involved in a major renegotiation of the Tri-Party Agreement and wanted public input to help guide the renegotiations.

The Task Force included representatives of Tribal, state and local governments, business, economic development, agriculture, environmental groups, interest groups, labor and public health. The group met four times from May through September 1993.

The Task Force expanded on and reinforced the principles relating to overall Hanford cleanup that were initially recommended by the Future Site Uses Working Group.

The Task Force also identified values specific to the tank waste treatment program. The process provided new opportunities for public input to influence Hanford decision-making and was the springboard for formation of the Hanford Advisory Board.

June 1993

- Tom Grumbly is confirmed by the U.S. Senate as Energy Assistant Secretary for Environmental Restoration and Waste Management.
- Energy Assistant Secretary Grumbly comes to Hanford to investigate an accident that seriously injures a Hanford worker. Lou Beatty receives second and third degree burns from steam escaping from a valve. Energy Secretary O'Leary had recently said any worker death or serious injury would be investigated by a top Headquarters official. Beatty dies a week later.
- Groundbreaking ceremonies are held for a new \$18 million liquid waste treatment plant. The plant will treat liquids from 300 area facilities which now discharge untreated liquids into the ground. The plant is scheduled to be operational in late 1994.
- Westinghouse sends 80 tons of contaminated soil through a soil washing machine to see if the technology can be effective with radioactive materials. The results will be studied for six months.
- A GAO report says aging and inactive DOE facilities pose a serious threat to workers' health and safety. The report says some facilities at Hanford do not receive routine maintenance and inspection, as required by DOE regulations.
- The Uranium Oxide plant completes its final run. Since early April, the facility processed 200,000 gallons of a liquid uranium-based solution into a powder.

July 1993

- A 64-foot tall, 19,000 pound circulation pump is installed in tank SY-101. The pump is designed to constantly mix the waste, releasing small amounts of hydrogen on a continuous basis, rather than allowing a large buildup of hydrogen to occur. A series of tests are conducted on the mixer later in the month.

"The whole job was done flawlessly. The teamwork was incredible."

– Harry Harmon, Westinghouse Hanford Company. (Tri-City Herald, July 6, 1993).

- The Defense Nuclear Facilities Safety Board urges DOE to expand and accelerate its tank



Installing the mixer pump in tank SY-101.

waste characterization program at Hanford. The DNFSB concludes additional characterization is essential for ensuring safety in the near term, and necessary for permanent treatment of the waste. The DNFSB recommends DOE complete safety-related sampling and analysis of all watch list tanks within two years.

- The Oregon Department of Energy asks DOE for information about what damage a serious earthquake could cause to Hanford's K-Basins and the potential that would result in a release of radioactive material to the environment.
- Energy Assistant Secretary Tom Grumbly testifies before a Senate Committee on Hanford's tank problems. He says DOE will design a plan by the end of August to resolve safety and health problems related to the tanks.

"To put it bluntly, we need to get the tanks out at Hanford under control...The frightening thing is nothing has been cleaned up. There is paper pushing, there are clouds of dust out there, but nothing is being accomplished. We don't intend to shove billions of dollars into this without results." – Senator Bennett Johnston of Louisiana, Chair of the Committee. (Tri-City Herald, July 30, 1993).

"What I fear is that this \$20 billion has not even begun to scratch the surface of cleaning up this nation's atomic energy defense wastes. I fear that we are staring into a toxic abyss of unimagined depth and unknown characteristics." – Oregon Senator Mark Hatfield. (Tri-City Herald, July 30, 1993).

August 1993

- Westinghouse awards two eight year contracts for laboratory analysis, valued at \$240 million.
- A Hanford worker tapes a rock to a rope and drops it into a waste tank to see if a pipe is plugged. He is slightly contaminated. DOE officials shut down tank farm work except for

monitoring and essential maintenance and order 350 workers to undergo remedial safety training. The incident follows 17 lost time accidents at the tank farms in the past 12 months.

"One time out of 100 someone will cut corners to get the job done. We can't have

August 1993 continued

that one in 100...Winging it is not the way we deal with a drain plug in a hazardous area." – Kaiser President Dick French. (Tri-City Herald, August 13, 1993).

"The accident rate is unacceptable to us. Unless we change the way we do things...we're going to have another death." – Hanford Deputy Manager Phil Hamric. (Tri-City Herald, August 13, 1993).

"That was one of the more stupid activities I've heard about on a (nuclear) reservation." – Energy Assistant Secretary Tom Grumbly. (Tri-City Herald, August 14, 1993).

- Energy Assistant Secretary Tom Grumbly says cleanup of the weapons complex may exceed one trillion dollars in cost. At a conference on environmental restoration and waste management in Kennewick, Grumbly says estimates of \$50 billion for Hanford cleanup aren't realistic. William Wiley, director of Battelle, says Hanford cleanup could top \$250 billion.
- A proposal is made to complete two unfinished Washington Public Power Supply System (WPPSS) nuclear reactors to destroy the nation's surplus plutonium and create electricity. The "Isaiah Project" would complete WPPSS #1 at Hanford and WPPSS #3 at Satsop in Western Washington.

September 1993

- Tank SY-101 vents, 26 minutes after the mixer pump is started. Hanford officials say the pump, when it begins normal operations, should allow for a gradual release of hydrogen in the tank's waste.
- The Tank Waste Task Force issues its final report. The Task Force concludes the need for cleanup is compelling and urgent, and encourages the Tri-Parties to "get on" with cleanup. The Task Force also recommends the Tri-Party Agreement be strengthened and improved.

"Getting on with it means that we make use of available technology and resources now, and that we do so without precluding future application of emerging technology. We must do well all that we know now how to do, and we must persist in seeking answers for the questions that remain." – From the Tank Waste Task Force Final Report, September 1993.

- Energy Assistant Secretary Grumbly announces a plan to address safety issues at Hanford's tank farms. The plan includes additional training and recertification of tank farm operators. Grumbly also says installation of gas monitoring equipment in 23 tanks will be accelerated and leak detection systems in the tanks will be upgraded.

- DOE announces it is looking at seven sites, including Hanford, for permanent storage of spent nuclear fuel from Navy vessels and DOE reactors. The action is the result of a federal court ruling that DOE examine alternatives to storing spent fuel at the Idaho National Engineering Laboratory.
- A two day "Hanford Summit" is held in the Tri-Cities. The summit focuses on public involvement, regulations review, worker training, and technology transfer. Energy Secretary O'Leary pledges to streamline Hanford's cleanup, to declassify large amounts of DOE documents within 30 days, to push to transfer Hanford's lands to public use as soon as possible, and to pay attention to employee's concerns about whistleblower issues. She also announces the end of a hiring freeze to help deal with tank safety issues, said she would meet with Tribal representatives within three months, will explore funding for public involvement activities and will work with the state to explore the creation of a Hanford advisory panel.

"This has been a helluva year, one which has anguished each and every one of us. We will correct that." – Energy Secretary Hazel O'Leary. (Tri-City Herald, September 16, 1993).

October 1993

- DOE, EPA and Ecology complete renegotiation of the Tri-Party Agreement. The renegotiation allows for a delay in constructing the vitrification plant, the addition of a vitrification plant for low-level waste, and extends overall cleanup by ten years. It sets a new target date of 2028 to complete all vitrification of tank waste. The revisions also escalate actions to treat contaminated groundwater. DOE abandons the grout program, despite costs so far of \$200 million.

"It reflects a higher priority on dealing with urgent safety problems and will allow us to get the majority of the waste out of old, deteriorating tanks on a faster schedule."
– Energy Assistant Secretary Tom Grumbly (DOE News Release, October 1, 1993).



Grout vaults under construction — the grout program was abandoned as part of a TPA renegotiation.

- A committee conducting an independent review of possible missions for FFTF recommends to Energy Secretary O'Leary that the reactor be shut down.

"There is no combination of compatible missions for the Fast Flux Test Facility that has reasonable probability of making the facility financially viable in the foreseeable future." – Letter from Energy Secretary Hazel O'Leary to House Speaker Tom Foley of Washington. (October 7, 1993).

- A House-Senate Conference committee approves a spending bill that includes \$2 billion for Hanford, including \$1.6 billion for cleanup.

"Hanford will remain in the limelight and work there is likely to remain under a microscope to see how efficiently we use those dollars." – John Lindsay, President of Tri-City Industrial Development Council. (Tri-City Herald, October 15, 1993).

- The second test phase of the SY-101 circulation pump begins. The pump is run at increased speeds for longer periods of time.
- DOE announces plans for cleanup of the 1100 area and the former Nike missile headquarters at the base of Rattlesnake Mountain.

November 1993

- Energy Secretary O'Leary meets with a group of whistleblowers, including some from Hanford. She says she will not tolerate retaliation against whistleblowers.

"I need whistleblowers, the department needs whistleblowers and our country needs whistleblowers...I commit today to zero tolerance, zero tolerance of reprisals."
– Energy Secretary Hazel O'Leary. (Tri-City Herald, November 7, 1993).

- DOE announces its final plan for disposal of eight former nuclear production reactors on the Hanford Site. The reactors will remain where they are for 75 years to let radioactive materials decay. The reactor cores will then be moved away from the Columbia River and buried on site. Earlier, DOE had indicated the reactors would be moved away from the river within 30 years.

November 1993 continued

- Energy Assistant Secretary Grumbly gives approval for construction at Hanford of an \$89 million Waste Receiving and Processing (WRAP) facility. WRAP will analyze, package and sort waste, much of which will eventually go to the Waste Isolation Pilot Plant.
- Regular operations at Hanford's tank farms resume following a halt to all but critical activities three months ago.

December 1993

- A Massachusetts-based consortium proposes to DOE to construct a privately funded high-level waste vitrification plant at Hanford. The plant would be a replica of plants used in France. The consortium says it would spend more than \$1 billion, and DOE would pay only after waste is glassified. DOE officials say the proposal is worth considering.
- Energy Secretary O'Leary orders the permanent shutdown of FFTF.
- Energy Secretary O'Leary reveals that during the Cold War, the government conducted more than 800 radiation tests on 600 people. O'Leary says she was "appalled, shocked and deeply saddened" to learn 18 people were injected with plutonium without their knowledge. O'Leary also says the U.S. Government conducted 204 unannounced underground nuclear tests between 1963 and 1990, several of which resulted in radioactive material releases to the environment. O'Leary also releases information on the nation's plutonium stockpile. Hanford has over 12 tons of plutonium on site – most of it reactor-grade fuel, but also about 441 pounds of weapons-grade plutonium. Hanford produced about 60 percent of the nation's plutonium.
- A DOE report says tons of spent nuclear fuel are stored unsafely in storage pools at Hanford, the Savannah River Site and the Idaho National Engineering Laboratory. In addition, spent fuel buried in trenches at Hanford and at the Oak Ridge Site also poses hazards. The report concludes fuel storage facilities and three burial grounds warrant priority action. The sites at Hanford are the PUREX canyon, the K-East basin, and a burial ground in the 200 West area.
- A GAO report says technology to transmute (or change) radioactive waste into a less radioactive form is decades and billions of dollars away from practical application.

"...any practical application is at least decades away, and a number of constraints would slow or prevent application should it be actively pursued."
– GAO Report (GAO/RCED-94-16, December 1993).
- DOE says it will not pay Westinghouse Hanford a \$2 million performance bonus the contractor had expected to receive. Westinghouse got the lowest rating in its seven years as Hanford's primary contractor, following numerous safety problems and the death of a worker.
- Battelle Pacific Northwest laboratory releases a summary of secret radiation experiments conducted by Hanford and Hanford-funded scientists during the Cold War. Tests included the injection of five people with phosphorus 32, irradiation of inmate sex organs at both the Washington and Oregon State Penitentiaries, and exposure of 15 people to tritium.

January 1994

- The Hanford Advisory Board (HAB) conducts its first meeting. HAB members spend much of the first meeting discussing how they will function, and what issues they should tackle.

"We have an enormous agenda over the next few years of what you could grapple with. Whatever you pick, stick with it."

– Energy Assistant Secretary Tom Grumbly. (Tri-City Herald, January 26, 1994).

"I've been skeptical of these committees working twice in the past. And I've been wrong twice. I'm prepared to be proven wrong again." – Dan Silver, Washington Department of Ecology. (Tri-City Herald, January 26, 1994).

Hanford Advisory Board

The Hanford Advisory Board (HAB) provides a forum for seeking a regional consensus on Hanford cleanup activities. It meets under authority of the Federal Advisory Committee Act. Its primary mission is to provide informed recommendations and advice to DOE, EPA and Ecology on major policy issues related to the cleanup of Hanford.

The HAB was formed based on stakeholders' and DOE's experience with two previous advisory groups – the Tank Waste Task Force and the Future Site Uses Working Group. HAB's membership is broadly representative of the diverse interests affected by Hanford cleanup issues. Members include Native American tribes, local governments, the State of Oregon, workers, environmental groups, public health, local business, and other public interest groups.

The HAB makes use of a committee structure to define and focus the issues before consideration by the full board. The HAB operates through a consensus process. Through May 2004, the HAB had reached agreement on 160 pieces of advice to the Tri-Parties.



The first meeting of the Hanford Advisory Board.

February 1994

- DOE again awards Bechtel an \$800 million, five year environmental restoration and management contract. An earlier award of the

contract resulted in a challenge by the losing bidders.

March 1994

- B Reactor is named a National Historic Civil Engineering Landmark by the American Society of Civil Engineers.
- DOE announces it will prepare an Environmental Impact Statement prior to re-starting the Plutonium Finishing Plant. DOE is considering

operations to stabilize nuclear materials at the plant, which has been in standby since 1990.

- Sue Gould is named Chair of the Hanford Advisory Board. She is a former Washington state senator.

April 1994

- Groundbreaking ceremonies are held for Hanford's \$228 million Environmental and Molecular Sciences Laboratory. The laboratory will be used to help develop new methods for cleanup. Construction work is soon stopped after human remains are discovered at the construction site.
- Groundbreaking ceremonies are held for Hanford's Waste Receiving and Packaging facility.
- Work is underway on a prototype earthen barricade, the "Hanford Protective Barrier." The barrier is intended to isolate waste areas and would use layers of rock, soil, gravel, sand and asphalt to form a barrier to help control how moisture migrates through the soil. Work on the barrier is halted after concerns are raised by Native Americans.
- A DOE study shows an uncontrolled nuclear reaction, or a "criticality" can not occur in Hanford's tanks. The issue was raised in April 1992.
- The independent scientific panel directing a study into past radioactive material releases from Hanford announces new findings. Among the major results: radioactive iodine 131 released to the air from Hanford in the 1940s and 1950s traveled over a larger area of the Pacific Northwest than scientists previously assumed; and the wider dispersion resulted in generally lower radiation doses to people near Hanford than previous estimates made in 1990. At some more distant locations, estimated doses were up to ten times higher than previously announced, although these doses were still far lower than doses near the site.

May 1994

- The mixer pump in tank SY-101 is working routinely.
- Energy Assistant Secretary Grumbly says DOE cannot follow budget recommendations from the Congressional Budget Office to cut cleanup funding 10 percent annually through 1999. He says further cuts would prevent DOE from resolving urgent risk issues and meeting cleanup agreements.
- Hanford officials say a major earthquake could cause a catastrophic accident at the K-Basins. An earthquake could cause a construction seam to fail, resulting in water leaking from the basins and exposing the spent nuclear fuel. The fuel could then spontaneously catch fire, releasing a plume of radioactive materials into the environment.
- DOE adds 10 tanks to the Watch List because of concerns about the presence of organics, which can ignite under certain conditions. Five of the ten tanks are already on the Watch List because of other concerns.
- The Defense Nuclear Facilities Safety Board says there is an urgent need for DOE to treat and stabilize plutonium-bearing materials and spent nuclear fuel at Hanford and other DOE sites.



Workers at the K-West Basin.

"The Board believes that additional delays in stabilizing these materials will be accompanied by further deterioration of safety and unnecessary increased risks to workers and the public." — DNFSB Recommendation 94-1. (May 26, 1994).

- DOE begins to ship 309 capsules of cesium 137 from an irradiation facility in Colorado back to Hanford for storage. Western states worked with DOE to develop a transportation safety plan for the shipments.

June 1994

■ Hanford Summit II is conducted in Pasco. The Summit focuses on compliance with federal and state standards and on economic development opportunities in the Hanford cleanup. Energy Secretary O'Leary says she will support an aggressive economic development plan for the region to help the transition from Hanford and federal funding. She also says DOE has not made as much progress as she had hoped when she made several promises at the first Hanford summit nine months ago.

■ Energy Secretary O'Leary reveals details about more Cold War human radiation experiments. More than 1,000 people may have been involved in the 48 experiments.



*Energy Secretary
Hazel O'Leary at
Hanford Summit II.*

July 1994

- Bechtel Hanford Company takes over environmental restoration duties at the Hanford Site from Westinghouse.
- Westinghouse officials report temperatures are rising in tank C-106 and they have begun to add water to the tank again to control the temperature rise. Westinghouse had stopped adding water to the tank in March to try and reduce the risk of a leak. It was later determined the new readings more accurately reflect the

true temperatures in the tank. A temperature monitor had been surrounded by a pocket of water, which gave false readings of about 140 degrees instead of the actual 210 to 230 degrees.

■ Los Alamos scientists agree with the conclusion that a temperature monitor in tank C-106 had been giving false readings for many years. They also say it might have been caused by a remixing of the sludge's lower waste layer, and could result in possible damage to the tank. Restrictive work status is instituted at the tank.

August 1994

- Several new laboratory hot cells are completed at Hanford, doubling the space to examine Hanford wastes. The hot cell expansion began in 1992.
- DOE officials say an unsolicited private bid to vitrify Hanford's tank wastes is not acceptable.

"We have concluded that it would be more prudent to proceed on the basis of a competitive procurement on an accelerated timetable..." — Energy Assistant Secretary Tom Grumbly. (Tri-City Herald, August 9, 1994).

- DOE concludes tank C-106 is not heating up, and is operating safely.
- Final tests are completed on a second mixer pump. The pump is a backup to the one being used in tank SY-101.

■ DOE announces it is seeking bids from corporations interested in managing, processing and disposing of Hanford's tank waste. Westinghouse officials, who now conduct these activities, say they are surprised at the announcement. DOE officials say they are simply trying to determine what level of interest there might be.

"This is the way you go out and open the door, rather than doing things behind closed doors. The department is saying, 'Here are the opportunities we have at Hanford, here are the problems we are facing. Are you interested?'" — Hanford Manager John Wagoner. (Tri-City Herald, August 25, 1994).

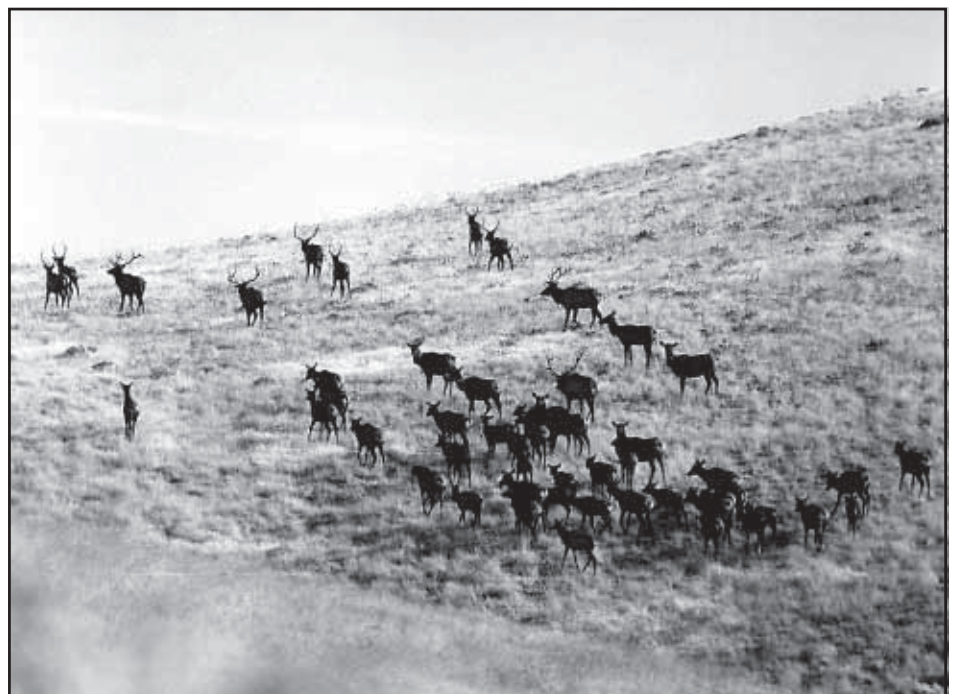
September 1994

- A GAO report says little cleanup has been accomplished by DOE in the past five years, despite expenditures of \$23 billion. The report says DOE is resistant to new technologies.
- EPA and Ecology issue a hazardous waste cleanup permit to DOE that covers all cleanup at five non-radioactive work sites. Additional permits are expected to eventually include another 55 waste sites. Ecology and EPA officials say the permit establishes clear regulatory authority over DOE cleanup efforts at these sites.

"The significance of it is that for the first time, Hanford has a (Resource Conservation and Recovery Act) permit issued, and it will form the foundation for future permitting at the site." — Dan Duncan, EPA. (Tri-City Herald, September 1, 1994).

- DOE says designs of six new double shell tanks are nearly complete and construction should begin within a few months.
- Safety controls are ordered for two Hanford tanks, BY-107 and BY-108, after vapor samples show higher than expected concentrations of organics. Additional sampling and analysis will be done at the tanks.
- DOE officials say they wouldn't completely rule out using Hanford treatment facilities for treatment of wastes from other sites. The announcement comes at a technical briefing for companies examining a DOE proposal to take over Hanford's tank cleanup program. Energy Assistant Secretary Grumbly says the plants would be dedicated primarily for waste from Hanford.

- Hanford officials say the fiscal year 1995 budget is \$63 million short of money needed to meet the cleanup schedule for environmental restoration work. The announcement came at a news conference to announce a shift at Hanford from investigation and analysis to cleanup.
- DOE officials say they are preparing to cut Hanford's fiscal year 1995 budget by \$194 million to offset shortages at other sites.
- Westinghouse and other contractors offer early retirement to 1,291 employees in an effort to reduce the Hanford workforce by 1,000 by December 31.
- Hanford officials mark the 50 year anniversary of B Reactor going critical.
- DOE announces the Fitzner-Eberhardt Arid Lands Ecology (ALE) Reserve and the North Slope area of the Columbia River are completely cleaned up. The two areas contain 260 square miles of land and represent 40 percent of the Hanford Site. There were 32 waste sites on the ALE and 39 on the North Slope. They included small motor pools and missile and anti-aircraft sites. Cleanup costs totaled \$6.8 million.



The Fitzner-Eberhardt Arid Lands Ecology Reserve.

October 1994

- DOE, EPA and Ecology agree to changes in the Tri-Party Agreement, which would shift the environmental management program's top priority to cleanup along the Columbia River shoreline.
- Westinghouse recommends to DOE that K-Basin fuel be packed in water filled canisters, moved to some other location on site, then chemically dried and processed so it can be stored

safely in a dry environment. It is expected the spent fuel rods and sludge will be removed from the basins by 2000.



Spent nuclear fuel elements in one of the K-Basins.

November 1994

- Hanford workers install two video cameras in tank SY-101. Several more Hanford tanks are scheduled for similar monitoring systems.
- Representatives from four Indian nations ask DOE to involve them early in cleanup planning so they can help ensure sacred tribal sites are not disturbed. Tribal members say several sacred sites have already been disturbed at Hanford. The construction site for the Environmental and Molecular Sciences Laboratory was moved earlier this year after human remains were found.
- The Spokesman Review prints an in-depth report on spending at Hanford and concludes that billions of dollars have been wasted. The report refers to Hanford funding as a “river of public money” which “waters the south-central Washington economy.” The report says Energy Assistant Secretary Grumbly suspects one in three dollars is wasted and that after five years and \$7.5 billion, “Not a single major radioactive mess has been cleaned.”

“If putting a man on the moon had been opened up to a stakeholder process that included EPA, the state Department of Ecology, the downwinders, the upwinders, the press, the Native Americans... would we ever have got a man on the moon in that time frame.” — Adrian Roberts, Battelle Vice President, voicing frustrations of trying to move forward with new cleanup technologies. (Spokesman Review, November 13, 1994).

“We inherited a mindset that said, ‘Folks, whatever this costs, it’s in the national interest and we do it.’ You do it behind closed doors and you just do it. That mindset carried over into the earlier days of cleanup.” — Sid Morrison, former Congressman for southeastern Washington. (Spokesman Review, November 14, 1994).

- A letter from Energy Secretary O’Leary to Congress says DOE will no longer pay to maintain mothballed commercial nuclear reactors at Hanford or Satsop in Western Washington. It is believed this action ends any chance of finishing the reactors and using them to destroy surplus plutonium (the “Isaiah Project”).
- A GAO report finds 1,517 uncompleted maintenance projects at Hanford’s tank farms. The GAO recommends procedures be streamlined to speed up the maintenance.

December 1994

- Hanford Advisory Board Chair Sue Gould resigns. Eleven of 17 Board members who respond to a survey on the board's operations are critical of Gould's work as Chair.

"For any board to be effective, the chair must have the full support and confidence of the board...Clearly a large group of members feel that I don't fit the needs of the board." — Letter from Sue Gould to the Hanford Advisory Board, announcing her resignation as Chair. (December 2, 1994).

- President Clinton proposes over \$4 billion in cuts in nuclear waste cleanup funding during the next five years.
- Hanford contractors announce they expect to lay off 500-1,000 workers early in 1995.
- International Atomic Energy Agency representatives conduct their first inspection of surplus plutonium at Hanford, which is to be placed under international control.
- A DOE report says Hanford's Plutonium Finishing Plant is DOE's fifth most hazardous problem related to plutonium storage. The report looked at plutonium storage at 35 facilities in 12 states. Rocky Flats in Colorado is

rated the number one risk to workers and the public, with Savannah River second.

"Most facilities at Hanford are old and have significant amounts of plutonium...contamination is prevalent." — DOE Report on Plutonium Storage. (Seattle Post-Intelligencer, December 7, 1994).

- Both the Clinton Administration and incoming House Speaker Newt Gingrich suggest that perhaps DOE should be eliminated. Energy Secretary O'Leary says DOE is working on plans for a major reorganization of the agency.
- Work is underway at Hanford to move liquid waste out of eight single shell tanks, the most at one time since the early 1980s.
- Two employees at the Plutonium Finishing Plant inhale small amounts of plutonium.
- Energy Secretary O'Leary says she favors allowing the Yakama Indian Nation to manage the Arid Lands Ecology Reserve. DOE is currently examining whether to have the Yakama Nation or the Bureau of Land Management manage the area.

"My personal preference is that rather than turning it over to another government agency, we should turn it over to real, live people." — Energy Secretary Hazel O'Leary. (Tri-City Herald, December 22, 1994).

- DOE announces the Nature Conservancy of Washington has discovered four new species at Hanford in the past year. The discoveries include three insects belonging to the leafhopper group, and one new plant species.



Hanford's Plutonium Finishing Plant.

January 1995

- DOE proposes a \$1.29 billion Hanford budget for fiscal year 1996, which could result in an additional 2,700 job cuts beyond the 2,500 already expected by the end of this calendar year.
- The Hanford Advisory Board issues a news release, challenging DOE to honor environmental laws and Hanford cleanup agreements. The Board says DOE budget announcements anticipating major cutbacks in the cleanup budget show a “disturbing disregard” for DOE’s legal commitments.
- The 300 Area Treated Effluent Disposal Facility is completed ahead of schedule. The facility will treat waste water from nearby laboratories and other buildings in the area and is part of the strategy to end discharge of untreated waste water anywhere on site.
- Work is suspended on an underground barrier at the N Springs. The soil is so dense the barrier cannot be installed as designed. The barrier is intended to slow the movement of groundwater to the Columbia River until strontium 90 in the groundwater can be pumped and treated.
- Energy Secretary O’Leary endorses 26 initiatives related to Hanford cleanup. The initiatives are intended to speed up cleanup, declassify more documents, and increase stakeholder participation in Hanford decision-making.
- The Tri-Parties reach agreement on schedules for cleanup and deactivation of four major Hanford facilities – PUREX, the Uranium Trioxide Plant, FFTF and parts of the Plutonium Finishing Plant. Deactivation of the Uranium Trioxide Plant is completed four months ahead of schedule. The facility formerly converted liquid uranium to a powder form.



The 300 Area Treated Effluent Disposal Facility.

February 1995

- A DOE report says DOE ignores technology developed by national laboratories that could speed cleanup and cut costs. It suggests one national lab be designated as the lead in coordinating cleanup research and technology development. The report says many sites have simply stopped looking for new, innovative solutions and are only interested in avoiding risk.
- Westinghouse places contracts with seven companies to test a variety of technologies for vitrifying low-level waste.
- The City of Richland proposes the Hanford Advisory Board restructure and cut its budget by more than half, to \$250,000. The proposal is overwhelmingly rejected by the Board. Richland officials say the changes are necessary because of major DOE budget cutbacks and job losses.

“It has a name: ‘the Hanford syndrome.’ It has become widespread and severe in the EM (Environmental Management) program. Its symptoms are an unwillingness to alter familiar behavior patterns, to stick with unproductive or failing procedures... and to oppose innovation.” — From a DOE report on technology development. (Tri-City Herald, February 2, 1995).

“Our sweat equity in this board more than matches what’s being spent. We’re a good business investment and DOE and the regulators are just starting to reap the benefits.” — Dr. Richard Belsey, HAB member. (Tri-City Herald, February 3, 1995).

February 1995 continued

- The Hanford Advisory Board elects Marilyn Reeves as Chair. She has been acting Chair since Sue Gould's resignation in December. Reeves represents the Oregon League of Women Voters on the HAB.
- The Hanford Advisory Board adopts an 11-point advisory that says Ecology and EPA should impose strict controls on mixed waste transfers from other DOE sites to Hanford. Among the points: Hanford must have storage capacity, processing ability and funding to handle any new waste; new waste must comply with Washington State's Dangerous Waste law and the terms of permits and other consent orders and agreements; and Ecology and EPA should not permit long-term storage of other DOE sites' mixed wastes at Hanford.

"The bottom line is that imported waste must not make Hanford cleanup problems worse." — Marilyn Reeves, Hanford Advisory Board Chair. (HAB News Release, February 3, 1995).

- Bechtel recommends against installing the N Springs barrier. Bechtel officials say the flow of

strontium 90 to the river is only one fifth the previous estimates. Bechtel also says contaminants would likely seep beneath the barrier. Regulators say they want to review Bechtel's data before supporting their position.

- Energy Secretary O'Leary says DOE plans to pursue privatization to vitrify Hanford's tank waste. Under the plan, DOE will offer a fixed price contract and will only pay for treated waste that meets DOE specifications. At least 14 companies have expressed an interest.
- Energy Assistant Secretary Grumbly visits Hanford to explain the impact of budget cuts. He says Hanford's workforce should stabilize in fiscal year 1997 at between 12,000 and 13,000 workers (it was 17,312 at the end of December 1994).



*Energy Assistant Secretary
Thomas Grumbly.*

March 1995

- Hanford Manager John Wagoner says waste volume in the tanks has been reduced from 61 million gallons to 56 million gallons through use of the site's evaporator. Wagoner says Hanford may not now need two of the six new double-shell tanks currently planned.
- Energy Assistant Secretary Grumbly tells Congress that further cuts in DOE's cleanup budget would likely lead to lawsuits, which could then result in federal courts directing cleanup activities. He says further cutbacks would also endanger workers and hurt DOE's relationship with states and stakeholders.

"It would put me wildly out of compliance with the agreements. The states would sue us and they would win, according to my lawyers. And we could have things run by the courts. That would be the absolute

worst outcome." — Energy Assistant Secretary Tom Grumbly, in response to a suggestion of a further \$1 billion cut. (Tri-City Herald, March 9, 1995).

- A report to the Senate Committee on Energy and Natural Resources says Congress must act decisively to salvage the Hanford cleanup program and prevent further waste of taxpayer money. "Train Wreck Along the River of Money, an Evaluation of the Hanford Cleanup," concludes that Hanford management cannot achieve a cleanup that is cost-effective and protective of human health and the environment without major changes. The report, also called "the Blush Report" after one of its authors, says the Tri-Party Agreement hinders cleanup and "Hanford is floundering in a legal and regulatory morass."

March 1995 continued

"Many of the schedules in the TPA are unworkable, disjunctive, lack scientific and technical merit, undermine any sense of accountability for taxpayer dollars, and most importantly, are having an overall negative effect on worker and public health and safety... significant cuts in the Hanford budget are necessary in order to regain control of the program..." — From the Executive Summary of "Train Wreck Along the River of Money." (March 1995).

"The report downplays the substantial cleanup progress that has been made at Hanford...It suggests simplistic solutions to problems that...are extraordinarily complex." — Energy Secretary Hazel O'Leary, in response to the "Blush Report." (DOE News Release, March 14, 1995).

- At a hearing before the Senate Committee on Energy and Natural Resources to discuss the Blush Report and potential legislation to improve cleanup at Hanford, Washington Senators Patty Murray and Slade Gorton defend the Tri-Party Agreement from attacks by other Senators and DOE officials.

"Anytime you talk about breaking a tripartite agreement negotiated in good faith by sincere people all trying to do the right thing...it sends people up the wall. But it simply must be done. We cannot get there from here." — Louisiana Senator J. Bennett Johnston. (March 22, 1995).

"The Tri-Party Agreement must not be scrapped. The TPA was inspired by the threat of litigation on several fronts, and it offers a way to work through the legal challenges facing this very toxic hazardous waste site...People in our region deserve a voice in their future. The TPA is their voice." — Washington Senator Patty Murray. (March 22, 1995).

"We have given him an impossible job. We have ordered him to meet standards he cannot attain, to use technologies that do not exist, to meet deadlines he cannot achieve, to employ workers he does not need, and to do it all with less money than that for which he has asked. If he fails, we have threatened to put him in jail."

— Louisiana Senator J. Bennett Johnston, speaking about the challenge of cleanup faced by DOE Assistant Secretary Tom Grumbly. (U.S. Government Printing Office, Minutes of the Committee on Energy and Natural Resources, Page 5. March 22, 1995).

- Senator J. Bennett Johnston of Louisiana considers introducing legislation to cap Hanford's budget at \$800 million annually, roughly half of current levels. At the last minute, he does not introduce the bill.

"I categorically reject the notion the overall cleanup is fatally flawed and that we should scrap the entire effort."

— Letter from Washington Attorney General Christine Gregoire to Alaska Senator Frank Murkowski, who is working with Senator Johnston on nuclear cleanup legislation. (March 21, 1995).

- Westinghouse says in the past year it has cleaned up more than three million square feet of surface radiation contamination.

April 1995

- DOE estimates Hanford cleanup will cost \$48.7 billion over the next 75 years. “Estimating the Cold War Mortgage” says cleanup at all 132 defense production sites will cost \$230 billion. The study is the first analytical review based on estimates provided by each site. Cleanup at the Savannah River Site is estimated to be about the same as at Hanford. Each site is estimated at roughly 21 percent of the total cost.

“It’s larger than the amount spent on the Apollo space program. It’s comparable to what it cost to build the weapons complex.” — Energy Assistant Secretary Tom Grumbly. (Tri-City Herald, April 4, 1995).

- A number of Congressional leaders say Hanford cleanup is out of control and discuss legislation to pre-empt the Tri-Party Agreement. Senator J. Bennett Johnston drafts, but does not introduce legislation to that effect.

“The Tri-Party Agreement is a failure and should be scrapped.” — Alaska Senator Frank Murkowski. (Tri-City Herald, April 17, 1995).

“It will be a political battle as well as a legal battle.” — Washington Attorney General Christine Gregoire, pondering a potential Congressional fight over the TPA. (Tri-City Herald, April 17, 1995).

- Workers complete the installation of steel barriers in the K-Basins. Spent fuel stored in the basins is now isolated from areas of the basins most vulnerable to earthquake damage.
- Westinghouse Hanford Co. issues 500 layoff notices.
- Defueling of FFTF is completed four and a half months ahead of schedule.
- DOE announces it is preparing a Programmatic Environmental Impact Statement on the disposition of surplus plutonium. Hanford is one of the sites to be studied for long term storage and also for methods of either “burning” the plutonium in a reactor or immobilizing it with other waste.
- Ecology issues DOE a permit for a Hanford liquid waste disposal facility located in the 200 area. It is the first permit issued by the state to Hanford to control a major liquid waste discharge.
- Hanford officials and regulators meet with Energy Assistant Secretary Grumbly in St. Louis to discuss how to overcome expected funding shortages during the next three years.

“I went into the meeting with guarded expectations. I came out believing it was the most successful meeting I’ve had with DOE in the decade I’ve worked with them on Hanford issues.” — Dan Silver, Ecology. (Tri-City Herald, May 3, 1995).

May 1995

- Hanford begins shipping 183,000 gallons of slightly contaminated nitric acid to Great Britain as part of the cleanup of PUREX.



A nitric acid shipment ready to depart for Great Britain.

- Energy Secretary O’Leary announces a major reorganization of DOE. The number of employees will be cut by 27 percent — a large percentage from Headquarters — and 12 small field offices will be closed.

May 1995 continued

- A consultant hired by the Hanford Advisory Board concludes DOE does not need any new double shell tanks. DOE has been planning since late 1994 to construct six new tanks at a cost of \$435 million, but also recently determined they were not needed.
- Washington Attorney General Christine Gregoire and attorneys general from more than a dozen other states meet to discuss drafting proposed legislation to protect the Tri-Party Agreement and similar agreements. The attorneys general say they are looking for ways to speed cleanup, but not at the loss of the states' rights to oversee the work.
- Senators Frank Murkowski and Bennett Johnston introduce a bill that would pre-empt the Tri-Party Agreement and certain federal laws in Hanford cleanup. The bill does not cap cleanup funding. Murkowski says he will also propose an amendment to the Nuclear Waste Policy Act to allow storage of commercial spent fuel at Hanford and the Savannah River Site.

"I believe Hanford and Savannah River offer excellent sites for the temporary, dry-cask storage of civilian nuclear fuel until a permanent geologic repository is available." — Alaska Senator Frank Murkowski. (Tri-City Herald, May 27, 1995).

"My gut reaction is we will not become the nuclear waste dump for the nation or the world. We have cleanup problems at Hanford we need to take care of first." — Washington Senator Patty Murray. (Tri-City Herald, May 27, 1995).

"It is an arrogant, naive and dangerous policy for the people of Washington." — Washington Attorney General Christine Gregoire. (Tri-City Herald, June 3, 1995).

June 1995

- Oregon's five House members write a letter to Alaska Senator Frank Murkowski, opposing Murkowski's suggestion that Hanford be used as a storage site for commercial spent fuel.
- DOE announces a new species of buckwheat is discovered at Hanford. In the past two years, researchers have discovered nine new species at Hanford – two plant species and seven species of insects.
- DOE and its contractors meet a major Tri-Party Agreement milestone related to stopping liquid

waste discharges into the ground. The 33 worst liquid waste streams at Hanford have all been stopped, treated, or re-routed away from hazardous waste disposal sites.

"From today forward, the problem gets better. We're not making the groundwater contamination worse. This is one of Hanford's greatest cleanup successes since 1989." — Doug Sherwood, EPA. (Tri-City Herald, June 30, 1995).

July 1995

- DOE says it is looking to accelerate K-Basin cleanup to December 1999. DOE officials hope to finalize a plan for fuel removal by December 31, 1995. To meet a December 1999 date for removal of all the fuel, fuel removal will need to begin by November 1997.

"It's doable and lets us take the bull by the horns and make it happen." — Beth Sellers, DOE. (Tri-City Herald, July 2, 1995).

July 1995 continued

- A study by a private group estimates the United States has spent \$3.9 trillion on its nuclear weapons program. This is the total estimated cost associated with research and development, weapons delivery systems, security, communications and control systems, dismantlement costs and environmental cleanup.
- A groundbreaking ceremony is held for the HAMMER training facility. The facility is designed to provide training and education programs to enhance the skills, knowledge and abilities of Hanford workers and emergency responders.
- Washington Senator Slade Gorton writes to his 99 fellow senators, asking them to take a closer look at the accomplishments at Hanford, and to not cut Hanford funding or pre-empt the Tri-Party Agreement.

"Legislation has been proposed that would dramatically, fundamentally and perhaps dangerously affect the principles which govern Hanford cleanup."

*— Washington Senator Slade Gorton.
(Tri-City Herald, July 29, 1995).*

August 1995

- More than 430,000 gallons of high-level radioactive waste is moved from a double-shell tank in the 200 West Area to a double-shell tank in the 200 East Area. It is the first time waste has moved through the transfer line in six years, and frees up much-needed double shell tank space in the 200 West Area to allow pumping of liquids from older, single-shell tanks.
- Energy Secretary O'Leary says DOE will cut 3,788 jobs over the next five years to save \$1.7 billion.
- President Clinton proposes a permanent ban on nuclear weapons tests.
- DOE issues its final report on radiation testing. Nearly 16,000 men, women and children were subjected to radiation experiments during the Cold War.
- Under new rules which grant more authority to the site, Hanford Manager John Wagoner gives approval to install new piping to connect two tank farms, as part of plans to eventually pump tank C-106.

September 1995

- A team which includes Fluor-Daniel, Lockheed Martin, Duke Engineering and others announce they have joined together to bid on the Hanford management contract. DOE plans to formally request bids in December, name the winner in May 1996 and have the contract in place in October 1996.
- The Oregon Department of Energy conducts an extensive statewide public involvement effort to gather input on DOE's Programmatic Environmental Impact Statement on the storage and disposition of surplus plutonium. The Department also asks for public opinion on what role, if any, Hanford should play in these activities. More than 800 Oregonians in 18 cities participate in the process, which also demonstrates low-cost methods of involving the public.
- DOE announces it will proceed with tank waste privatization. A draft request for proposal will be issued in November. At least six companies have expressed strong interest in a program which DOE estimates will eventually cost \$40 billion to treat all the tank waste.

*"The entire premise of privatization is the competitive dimension... We want to make sure that it's head-to-head competition throughout." — Jackson Kinzer, DOE.
(Tri-City Herald, September 30, 1995).*

October 1995

- The League of Women Voters of Washington, the Washington Physicians for Social Responsibility and 10 other organizations conduct the “Plutonium Roundtable,” a public forum to begin discussions on policy choices related to the transport, storage and disposal of surplus plutonium.
- DOE and its contractors admit plans to accelerate spent fuel removal from the K-Basins may have been too ambitious. A draft Environmental Impact Statement has been delayed, which impacts the accelerated schedule.
- Idaho reaches agreement with the Navy and DOE over radioactive waste storage at the Idaho National Engineering and Environmental Laboratory (INEEL). In return for allowing the Navy and DOE to ship spent fuel to INEEL for

storage, the federal government agrees to schedules to begin moving waste out of Idaho, with all spent nuclear fuel and transuranic waste removed by 2035.



Spent nuclear fuel elements in the K-East Basin.

November 1995

- New efforts begin to try and save the Fast Flux Test Facility. Energy Secretary O’Leary agrees to a delay in draining the reactor’s sodium coolant, a step which many believe would shut the reactor down for good.
- DOE is studying whether to add 22 tanks to the Watch List. The tanks would be added because of concerns about flammable gasses. As a safety



Aerial view of a Hanford tank farm.

precaution, DOE orders tank farm workers to follow the same work procedures required for Watch List tanks for all Hanford tanks until each has been reviewed.

- DOE releases its draft request for proposal to privatize treatment of Hanford’s tank wastes.

“This project will take the burden off the taxpayer’s backs and provides tremendous business opportunities to environmental and engineering firms.” — Energy Assistant Secretary Tom Grumbly. (DOE News Release, November 20, 1995).

- DOE awards a \$24 million 15 year contract to Allied Technology Group (ATG) to treat Hanford’s low-level mixed waste. ATG will receive no payments until facilities are built and operating and waste is treated. That is expected to take about five years.

December 1995

- Hanford’s fiscal year 1996 budget has \$1.35 million for cleanup activities – less than DOE said was needed, but not as significant a cut as was first feared.
- During 1995, the Hanford workforce shrinks from 18,000 to 13,200.

January 1996

- Grant and Franklin counties receive their first payments in lieu of taxes for Hanford land taken off the local tax rolls.
- Bids are issued for the contract to manage Hanford site operations. The five year contract is estimated to be \$4.6 billion, with options for five more years.
- Hanford Site Manager John Wagoner says DOE is reassessing how Hanford can be cleaned up faster and cheaper.

"I think when this is all in place, that instead of accelerated cleanup being a budding idea, it will be a reality. And yes, there are

all kinds of perils, but I believe this will happen."
— Hanford Site Manager John Wagoner. (Tri-City Herald, January 13, 1996).



Hanford Site Manager John Wagoner.

- Ecology fines DOE and Bechtel \$5,000 for hazardous waste violations. One incident resulted in pressure building up inside a barrel, causing the lid to blow off. Ecology also cites a lack of worker training for cleanup of four evaporation basins.

February 1996

- DOE says increased safety measures in place at the tank farms could result in delays to the cleanup schedule.
- A National Academy of Sciences study suggests many Hanford tanks should be studied to see if wastes could be permanently stored in them. Barriers would be installed to protect the surrounding environment. The Academy did not recommend this as an action, but suggests it is deserving of further study.
- New tests show cesium leaking from the tanks has gone deeper in the soil than had been thought. Cesium is detected in dry wells 125 feet below the surface, 85 feet above groundwater. New data also shows a plume of technetium 99 in the groundwater beneath the SX tank farm in the 200 West area.

"We have been assured for many years that contaminants from the tanks were trapped in the soils beneath the tanks and were not traveling downward to the groundwater. This new information concerns us...(The) long-term risk has escalated. The data shows that time is not on our side. We need to quickly retrieve and treat all the tank waste." — Ecology Director Mary Riveland. (Tri-City Herald, February 21, 1996).

- DOE asks for bids to vitrify Hanford's tank wastes under a "privatization" contract. DOE is asking private companies to pay all up-front design, construction and operating costs without federal appropriations. They would get paid only when they have turned waste into glass. DOE's intent is for private industry to take on a large share of the risks of this incredibly complex and expensive project.

"In the past, the Department has been long on promises and short on results in its efforts to solve the Hanford tank waste problem... we expect at least a 30 percent savings over the traditional ways of doing business." — Energy Secretary Hazel O'Leary. (DOE News Release, February 20, 1996).

- DOE conducts a day-long workshop focusing on the fiscal year 1998 budget. It is the earliest DOE has involved the public in the budget process. DOE officials say there is not enough money available to meet cleanup needs.
- Two specially equipped helicopters are conducting a radiological survey of the entire Hanford Site. The survey will plot radiological contamination at Hanford and serve as a baseline to track any movement of the contamination since the last survey in 1988.

March 1996

- The Washington State Legislature passes a resolution supporting restart of FFTF. Meanwhile, DOE officials can not agree on whether FFTF could produce a sufficient amount of tritium for the nation's nuclear weapons program.
- The high-level waste vitrification plant at Savannah River begins operation, several years behind schedule. Operating problems will persist for some time.
- DOE announces that the TY Tank Farm is the first to be "Controlled, Clean and Stable." This classification requires removal of all pumpable liquids from any single shell tanks, installation

of remote computer monitoring equipment, removal of surplus contaminated equipment from around the tanks, decontamination of above-ground equipment surfaces, and covering the tank farm with clean gravel to shield against contaminated soil. The tank farm contains six single shell tanks, five of which are known or suspected leakers.

- DOE accepts three proposals for the Project Hanford Management Contract to replace Westinghouse as the primary Hanford contractor. The teams submitting offers are led by Bechtel Northwest Corporation, Fluor Daniel Hanford and Raytheon Hanford.

April 1996

- DOE announces plans to begin pump-and-treat operations to remove chromium from groundwater in several locations along the Columbia River. The chromium – used in cooling water in Hanford reactors to inhibit corrosion – is entering the Columbia River in the Hanford Reach, a prime salmon spawning area. The pump-and-treat systems are expected to be operating in the 100-D and 100-H Areas by March 1997, and in the 100-K Area about three months later.
- DOE and Ecology release a draft Environmental Impact Statement on cleaning up Hanford's tank waste. The EIS explores nine alternatives. The preferred alternative is consistent with the Tri-Party Agreement, whereby private contractors will demonstrate pre-treatment and high- and low-level waste vitrification. Treatment facilities will then be expanded.

"The preferred alternative most closely reflects the public's demands to get on

with cleanup while protecting the environment and people of the Northwest."
— Ecology Director Mary Riveland. (DOE/ Ecology News Release, April 10, 1996).

- Minnesota Senator Rod Grams introduces a bill to eliminate DOE and turn cleanup over to the Department of Defense.

"An agency with no mission, no purpose and no legitimate future." — Minnesota Senator Rod Grams, speaking about DOE. (Tri-City Herald, April 17, 1996).

- A GAO audit shows 25 incidents in the tank farms in 1995 that could be blamed to human error.
- Energy Secretary O'Leary visits the Tri-Cities. She provides \$5.5 million for economic diversification efforts, meets with whistleblowers, and dedicates the Canister Storage Building.

May 1996

- The U.S. Senate confirms Tom Grumbly as DOE Under Secretary and Al Alm as Assistant Secretary for Environmental Restoration and Waste Management.
- Two firms submit proposals for the tank waste vitrification privatization project. The two teams are led by BNFL Inc. and Lockheed Martin.

"This is a major step toward bringing the innovation and efficiency of the private sector to bear on DOE's environmental cleanup mission." — Ron Izatt, Hanford Deputy Manager. (DOE News Release, May 13, 1996).

June 1996

- Bechtel receives its highest rating ever, and earns 90.55 percent of its performance fee. DOE officials cite Bechtel's progress in getting the Environmental Restoration Disposal Facility ready, and cleanup work at B and C Reactors.
- Hanford's waste evaporators complete the boiling off of one million gallons of liquid. It reduces the volume of liquid wastes in the tanks to 54 million gallons. Since 1994, the evaporators have eliminated eight million gallons of liquid from the tank farms.

"Every time we reduce waste volume by one million gallons we avoid spending about \$75 million to build a new tank."



Hanford's 242-A Evaporator Facility.

— Ami Sidpara, DOE. (DOE News Release, June 10, 1996).

- DOE announces chromium and technetium 99 have been found in groundwater beneath the 200 West area, and cobalt 60 has been found 100 to 125 feet deep in boreholes.
- DOE completes removal of all plutonium from PUREX, and shuts off its criticality alarm.

"For a lot of the old-timers who were here when PUREX was a big cog in the production effort, it was kind of a sad day. To turn off the criticality alarm means an era really has come to an end." — DOE Spokesman Guy Schein. (Tri-City Herald, June 21, 1996).

- Oregon Senators Mark Hatfield and Ron Wyden introduce an amendment in a defense bill to require DOE to provide Oregon with the same information on Hanford as it provides Washington State, and at the same time.
- DOE removes four tanks from the ferrocyanide Watch List.

July 1996

- Hanford Manager John Wagoner sends a memo to Benton County planners, saying agriculture should not be considered on the Hanford Site for the "foreseeable future." Benton County had sought comments on a preliminary plan on what Hanford lands should be set aside for habitat. Wagoner says current and future waste sites and the contaminated groundwater should rule out agricultural use, and that irrigation would speed migration of contaminants into groundwater and the Columbia River.

"Agriculture has a significant potential for worsening this contamination and accelerating the migration of contamination."
— Memo from Hanford Site Manager John Wagoner to Benton County. (Tri-City Herald, July 9, 1996).

- Westinghouse workers complete deactivation of the Fuels Development Laboratory (the 308 Laboratory). Annual upkeep costs drop from \$12 million to \$160,000. The 308 Laboratory was used in 1960 to make fuel for a nearby test reactor.
- DOE determines it will not add 25 Hanford tanks to the Watch List for flammable gasses. DOE scientists conclude the sludges in the tanks do not generate enough gases to require extra safety measures.
- DOE fines Westinghouse \$37,500 for safety code violations in a February incident that exposed a worker to radiation.

July 1996 continued

- As part of the “cocooning” of C Reactor, the two water towers at the reactor are leveled by explosives. The 175 foot tall towers stored 300,000 gallons of cooling water. They were built in 1952 and used until the reactor was shut down in 1969.

C Reactor Cocooning

DOE’s plans for eight of Hanford’s nine shut-down nuclear production reactors is to place the reactors into a safe storage condition for the next 75 years. C Reactor is the first reactor to go through this “cocooning” process for safe, interim storage.

Most of Hanford’s reactors were shut-down in the late 1960s and early 1970s. Since then, little maintenance had been done on the buildings, and they presented a number of hazards. One Hanford worker was killed in April 1992 when he fell through the roof of F Reactor.

C Reactor operated from 1952 to 1969, then was basically abandoned. Its condition was typical of the other reactors – its roof leaked, there were loose wires, asbestos hazards, and small animals made their homes in the buildings.

As part of the cocooning, all surface contamination and surplus materials were removed throughout the reactor building. All support buildings were removed (23 of 24 buildings at the reactor site). The four-foot thick concrete walls of the main reactor chamber became the outer walls. A new high-strength, corrosion-resistant galvanized steel roof was added. Workers welded shut the only remaining door. It will be re-opened and the reactor inspected once every five years.

After 75 years, during which time the radioactivity in the reactor will greatly decrease through natural decay, the plan is to move the eight reactors to the 200 area for burial.



The demolition of C Reactor’s water towers.

- Hanford loses \$10.1 million in funding to other sites. It is part of \$35 million needed for “urgent requirements” elsewhere, including \$20 million at Rocky Flats. DOE officials say Hanford’s cut will come mostly from planned environmental restoration work. Four million dollars of the \$10.1 million is supposedly a loan and will be repaid in the next fiscal year.
- DOE Assistant Secretary Al Alm visits Hanford and explains his 10-year cleanup plan.

“For years, the level of progress here seemed to inch up slowly. Now, there has been a stride and that makes a 10-year cleanup possible.” — Energy Assistant Secretary Al Alm. (Tri-City Herald, July 25, 1996).

- The Environmental Restoration Disposal Facility (ERDF) is dedicated. The \$45 million disposal pit is 1,000 feet long, 500 feet wide and 70 feet deep. It eventually will be expanded to hold up to 12 billion yards of contaminated soils.
- Construction begins on a new cross-site waste transfer line. It is expected to be complete in August 1997, and move wastes in February 1998. It will replace a barely-functional 40-year old system.



The first load of waste is dumped at Hanford’s Environmental Restoration and Disposal Facility.

Ten Year Plan

In 1996, Energy Assistant Secretary Al Alm proposed a ten year program to accelerate cleanup at DOE’s nuclear weapons sites. The intent was to demonstrate success by completing cleanup activities at most DOE sites within 10 years, by 2006. While it was recognized that cleanup activities at DOE’s largest sites, including Hanford, would continue well beyond 2006, certain activities at these sites could also be accelerated. To succeed, the plan required additional funding during this 10 year period, but was expected to result in overall savings to the cleanup program. Rocky Flats in Colorado and Fernald in Ohio were among the sites targeted for accelerated cleanup activities.

The plan later evolved into “Accelerating Cleanup, Paths to Closure.” DOE called it a blueprint for their cleanup program, not a decision or budget document.

August 1996

- Fluor-Daniel Hanford Company is awarded a five year, \$4.88 billion contract to manage the Hanford Site. Options for a five year extension could make the contract worth \$9.56 billion. Westinghouse Hanford has been the primary Hanford contractor since 1987. Fluor Daniel will take over October 1.

"Before contract reform, the Department of Energy paid for simply showing up. Not anymore. If the contractors don't deliver on their commitments, we don't deliver on their dollars." — Energy Secretary Hazel O'Leary. (DOE News Release, August 6, 1996).

"The robust culture and attitude that a new firm brings to Hanford underscores

the new mission of Hanford. No longer is the purpose here to produce nuclear weapons, but to clean up the site."

— Energy Under Secretary Tom Grumbly. (Tri-City Herald, August 7, 1996).

- DOE says it will retain control of the Arid Lands Ecology Reserve to use as a buffer zone. DOE says it will negotiate an agreement with the U.S. Fish and Wildlife Service to manage the area while allowing greater public access. The Bureau of Land Management and the Yakama Indian Nation had proposed to assume control of the reserve.
- The Environmental Protection Agency says the 1100 area is cleaned up and should be removed from its Superfund list.

September 1996

- Most Westinghouse workers accept jobs with Fluor Daniel Hanford or its contractor team. Nearly 600 Hanford workers choose early retirement.
- All tanks are removed from the ferrocyanide watch list. DOE closes this out as a safety issue after determining the concentrations of ferrocyanide are too low for a credible accident to occur.
- Seven workers receive skin contamination in the 222-S analytical laboratory. They rushed to help a worker who's breathing apparatus had apparently failed.
- Seventy one acres of the 3000 Area is transferred to the Port of Benton.
- President Clinton signs the Defense Authorization Bill, which includes authority for DOE site managers to negotiate changes in consent agreements such as the Tri-Party Agreement. The legislation also designates Hanford as a "National Environmental Cleanup Demonstration Area."
- BNFL Inc. and Lockheed are each awarded \$27 million fixed price contracts to begin defining the technical, regulatory, and business and financial elements needed for privatized tank treatment facilities.

October 1996

- Fluor Daniel Hanford takes over as the lead contractor at Hanford.

"We are poised and ready for the innovative ideas of the Fluor Daniel Hanford team." — Hanford Manager John Wagoner (DOE News Release, October 1, 1996).
- Four workers at the Plutonium Finishing Plant are exposed to small amounts of plutonium.
- Fourteen environmental groups send a letter to Energy Secretary O'Leary, saying restarting FFTF would hurt Hanford cleanup.

October 1996 continued

- Energy Secretary O'Leary visits Hanford and participates in the dedication of the Environmental and Molecular Sciences Laboratory.



Energy Secretary Hazel O'Leary looks on as Mrs. William Wiley cuts the ribbon to open the Environmental and Molecular Sciences Laboratory.

- Washington Senator Slade Gorton and Representative Doc Hastings send Energy Secretary O'Leary a letter in support of restarting FFTF. Oregon's seven member Congressional delegation send their own letter, asking O'Leary not to produce tritium at FFTF.

*"FFTF can be used to meet critical national security needs in a cost-effective fashion."
— Letter from Senator Slade Gorton and Representative Doc Hastings to Energy Secretary O'Leary. (Tri-City Herald, October 16, 1996).*

*"Any movement away from the cleanup mission to one involving weapons production would be at cross purposes with the Department's commendable and increasingly successful efforts to strengthen and focus the Hanford cleanup mission."
— Letter from Oregon's Congressional delegation to Energy Secretary O'Leary. (October 15, 1996).*

November 1996

- Oregon Governor John Kitzhaber sends a letter to Energy Secretary O'Leary, opposing restart of FFTF for tritium production.
- Energy Secretary Hazel O'Leary submits her resignation.
- Fluor Daniel announces 750 Hanford Site layoffs are expected during 1997.

December 1996

- DOE announces a dual approach to dispose of surplus plutonium. Some of the plutonium will be converted to a fuel and used in reactors, the remainder will be vitrified. Hanford is considered a potential site for these activities.
- After eight years of negotiations, DOE and Benton County agree to payment in lieu of taxes. DOE will pay the county \$11.2 million.
- Westinghouse earns a final award fee of \$2.6 million for the six month period ending September 30, 1996. It is their highest rating since 1989.
- U.S. Secretary of Transportation Federico Peña is nominated by President Clinton as the new Secretary of Energy.
- DOE announces new data confirms cesium 137 is present beneath the SX tank farm. The cesium is found at the 130 foot level, 80 feet above groundwater.

January 1997

- Energy Secretary O'Leary says FFTF will remain on standby while it is evaluated as a backup source for tritium production.
- A GAO report says DOE should get rid of its non-essential lands, including Wahluke Slope and Fitzner-Eberhardt Arid Lands Ecology Reserve. The GAO concludes DOE has no use for this land. DOE disagrees with the GAO conclusions.



Part of the Fitzner-Eberhardt Arid Lands Ecology Reserve.

February 1997

- DOE releases a record of decision favoring privatization as the process to treat Hanford's tank waste.

March 1997

- The U.S. Senate confirms Federico Peña as Secretary of Energy.
- The Waste Receiving and Processing Facility (WRAP) begins limited operations. It is Hanford's first major solid waste processing facility and the first in the DOE complex to handle transuranic wastes.
- Hanford Site Manager John Wagoner says the Hanford budget may be nearly \$200 million short in fiscal year 1999. Hanford officials estimate they will need \$1.26 billion.
- A DOE audit shows Westinghouse was overpaid several million dollars in performance fees. The audit says some work was incomplete or substandard, DOE oversight was weak, or performance goals were too easy. DOE will try to recover the overpayments. Westinghouse officials don't agree with all the conclusions.
- Washington's Congressional delegation requests Congress approve sufficient set-aside for the tank waste privatization program. DOE is requesting a set-aside of \$427 million for FY 1998.



An analytical cell inside the Waste Receiving and Processing Facility.

March 1997 continued

- Energy Under Secretary Tom Grumbly submits his resignation. He then predicts large cutbacks and more layoffs at DOE's former nuclear weapon production sites. He says the biggest challenge facing cleanup is to keep funding coming from Congress.
- Babcock and Wilcox are successful in decontaminating and removing about 10,000 gallons of radioactive solvents from B Plant, four months ahead of the Tri-Party Agreement schedule. Removing the solvents was a major obstacle in meeting an accelerated cleanup schedule for B Plant.

Set-aside

DOE's privatization plans for the tank waste vitrification program required a private company to pay most of the up-front costs and begin to solidify waste before DOE would pay the company for its work. This could result in obligations of up to several billion dollars. However, the federal Anti-Deficiency Act forbids a federal agency from promising to spend money which has not been authorized by Congress. Therefore, DOE needed Congress to authorize funds through a "set-aside" for the tank waste vitrification program. These dollars would not actually exist as if they're in a bank account – the set-aside instead is an authorization for a future appropriation of funds.

Beginning with the Fiscal Year 1997 budget, DOE began to ask Congress to "set-aside" funds for the tank waste vitrification program. When DOE terminated its privatization contract with BNFL in 2000 and went to a more traditional "pay-as-you-go" funding, it was no longer necessary to retain the set-aside.

April 1997

- Regulators complain that communications with Hanford contractors are not good and have gotten worse since Fluor Daniel took over.
 - Plans to move sludge from the K-Basins into Hanford's tanks run into a snag with the discovery of PCBs in the sludge. Because PCBs fall under more stringent regulatory requirements, it could force major changes in the tank waste treatment program if the sludge is added to the tanks.
 - Removal of 197,000 gallons of waste from tank C-106 is expected to be delayed until the summer of 1998. It will likely result in missing a Tri-Party Agreement milestone.
- "It's painful to let the schedule slide like this. But it's the correct thing to do."*
— Jackson Kinzer, DOE Assistant Manager for Tank Farms. (Tri-City Herald, April 24, 1997).
- An expert panel studying the vadose zone concludes in a report that the method by which contaminants move through this area is poorly understood.

May 1997

- DOE announces Hanford Manager John Wagoner will be "loaned" to Brookhaven National Laboratory on a temporary basis. Brookhaven has recently come under intense scrutiny after a tritium leak forced shutdown of the laboratory's main research nuclear reactor.
 - A chemical storage tank explodes at the Plutonium Reclamation Facility, located in the Plutonium Finishing Plant complex. Eight workers are given conflicting instructions and are exposed to a chemical plume. DOE officials say they don't know what similar types of risks might exist on the site.
- "Either they really don't know what they have out there or they are being evasive. Neither of these options is very pretty."*
— Lynn Stembidge, Hanford Education Action League. (Tri-City Herald, May 16, 1997).

May 1997 continued

"I don't want to go back to work on Monday. There is still a possibility of another explosion. If they don't know what happened and why, there's still a damn good possibility it could happen again." — Winston McCulley, one of the workers who was exposed to the chemical plume following the explosion. (Tri-City Herald, May 15, 1997).



- Public meetings are conducted to explain the results of the Columbia River Comprehensive Impact Assessment. The effort began in 1993, to assess the effects of Hanford-origin materials and contaminants on the Columbia River environment, river-dependent life, and users of river resources. Additional study is recommended to better understand Hanford's impacts to the Columbia River and to help guide decision making on Hanford waste management, environmental restoration, and remediation.

- DOE acknowledges major problems with the response to the explosion at the Plutonium Reclamation Facility. Among the problems – workers received conflicting directions, which resulted in their exposure to a chemical plume; it took too long to declare an emergency; and it took too long to make off-site notifications. DOE officials say they are conducting a complete inventory of chemicals on the site to ensure a similar explosion can't occur.

The results of a chemical tank explosion inside the Plutonium Reclamation Facility.

June 1997

- New readings show a large increase in technetium 99 in a 200 Area monitoring well.
- DOE says it will need \$12.5 billion over the next 10 years to speed up Hanford's cleanup. The conclusion is part of the first draft of DOE's proposed 10 year master cleanup plan for DOE sites. The plan is designed to complete all work at smaller sites and accelerate some work at major sites.
- A ceremony is conducted to celebrate the deactivation of PUREX, 15 months ahead of

schedule and \$75.5 million under budget. Deactivation began in 1993 and ended in May. It cost \$147 million and cuts annual maintenance costs from \$34 million to \$1 million.

"PUREX was the greatest producer of special nuclear defense material in the United States...That's why the closing of PUREX symbolizes the end of the Cold War." — Lloyd Piper, Acting Hanford Manager. (Tri-City Herald, June 21, 1997).

July 1997

- DOE conducts a strategy meeting in Salt Lake City with regulators, tribal representatives and others to determine ways to close anticipated funding gaps in fiscal years 1998 and 1999.

The group agrees on goals of finding \$75 million in work performance efficiencies in fiscal year 1998, and \$160 million in efficiencies in fiscal year 1999.

August 1997

- Washington Senator Patty Murray asks Energy Secretary Peña to have DOE review the Project Hanford Management Contract. While praising the completion of several projects ahead of schedule, Murray wants DOE to examine safety issues related to the explosion at the Plutonium Reclamation Facility and other accidents, problems in getting a safety management plan approved, and the ability to meet cleanup deadlines.
- DOE budget projections show Hanford's budget dropping by \$318 million over the next two years. The report says the cleanup budget for fiscal year 1998 will fall \$98 million short of costs to comply with the Tri-Party Agreement. The gap could reach \$150 to \$220 million in fiscal year 1999.
- DOE, EPA and Ecology agree to a change in Hanford's approach to sampling and analyzing radioactive waste tanks. Originally, all tanks were to be analyzed by 1999. The new deadline is 2002.
- Oregon Governor John Kitzhaber and DOE Manager John Wagoner sign a Memorandum of Agreement which outlines a formal role for Oregon in cleanup decisions that may impact Oregon.

"What's important to us is knowing what issues are coming down early so we can evaluate the issues that are a priority for us."

— Michael Graine, Assistant Director, Oregon Office of Energy.
(Oregon Office of Energy News Release, August 13, 1997).

- Energy Secretary Peña makes his first visit to Hanford. He announces Fluor Daniel will conduct a review of their effectiveness and DOE will assess that review. He also expresses concerns about funding and says he will evaluate FFTF objectively.
- DOE and the U.S. Fish and Wildlife Service sign an agreement for management of the Fitzner-Eberhardt Arid Lands Ecology Reserve. DOE will maintain ownership.

"It was an accident of history that preserved the Reserve since we needed it as a buffer to ensure secrecy...It's ironic that amidst all of this environmental damage, the Reserve survived and remains today a unique and precious natural resource."
— Energy Secretary Federico Peña. (DOE News Release, August 27, 1997).



Energy Secretary Federico Peña (second from left), Washington Senator Patty Murray and Washington Congressman Doc Hastings at Hanford.

September 1997

- DOE announces an additional 14 month delay for the K-Basins project. DOE says more design and safety work are needed.

"Fluor-Daniel tried to put some reality into a schedule that in some sense was

unrealistic." — Charlie Hansen, DOE.
(Tri-City Herald, September 6, 1997).

- DOE is nearing completion on a master plan to sample soil and groundwater beneath the tank farms.

September 1997 continued

"My main concern when (DOE) comes up with a characterization plan is it won't have enough money to do it. The \$4 million proposed won't come close to solving the problem." — Ralph Patt, Oregon Office of Energy, at a Hanford Advisory Board meeting. (Tri-City Herald, September 6, 1997).

- Washington State fines DOE \$110,000 for violations that caused the May explosion at the Plutonium Reclamation Facility and for DOE's poor emergency response to the incident.
- The Chair of the Defense Nuclear Facilities Safety Board says corrective actions by DOE at Hanford's Plutonium Finishing Plant have been ineffective and may have contributed to the May 14, 1997 explosion at PFP's Plutonium Reclamation Facility. In a letter to Energy Assistant Secretary Al Alm, DNFSB Chair John Conway says DOE has not yet clearly identified the risks of handling fissile material at PFP and its contractors have yet to formally define which specific activities are necessary before these activities can be safely resumed.
- A ceremony is held to celebrate completion of a new cross-site transfer line – slightly ahead of schedule and under budget. The 6.2 mile transfer line replaces pipes built in the 1940s and last used in 1995.

"This is no ordinary pipeline. This has to deal with some of the most hazardous stuff on the earth." — Hanford Site Manager John Wagoner. (Tri-City Herald, September 19, 1997).



- The HAMMER Training Center is dedicated. The 120 acre facility is the most advanced hands-on safety training complex in the nation. It has 20 training props and will train workers and emergency responders.



Fire training at HAMMER's burn building.

"Where else can you set things on fire and blow things up? Grownups usually don't get to do these things." — Energy Assistant Secretary Al Alm at opening ceremonies. (Tri-City Herald, September 25, 1997).

"We control the environment but get (rescue workers') heart rates up. They can make mistakes here, but they're not fatal." — June Ollero, DOE HAMMER program director. (Tri-City Herald, September 25, 1997).

- Drilling is underway to extend an existing bore-hole to groundwater beneath the SX tank farm. It will be only the second hole drilled since 1989 in the tank farms to reach groundwater. The drilling is being done to determine whether leaking tank waste has reached groundwater.

Construction of Hanford's new cross-site transfer pipeline.

- Fluor Daniel marks completion of its first year as the Hanford Site's primary contractor.

"They didn't realize the magnitude of scale going up from Fernald to this." — Todd Martin, Hanford Education Action League, referring to Fluor Daniel's problems during its first year at Hanford. (Tri-City Herald, October 5, 1997).

"I was surprised that they talk and operate more like an oversight body than an advisory board." — Hank Hatch, Fluor Daniel President, referring to a contentious relationship with the Hanford Advisory Board. (Tri-City Herald, October 5, 1997).



The view inside Tank 241-Z-361.

The Z-361 tank holds about 20,000 gallons of sludge and 200 gallons of liquid.

- DOE approves the revised Fluor Daniel master safety plan for Hanford.
- Workshops are conducted in Washington and Oregon as part of a pilot for a "National Dialogue."
- DOE declares an Unreviewed Safety Question, based on concerns about whether a waste storage tank in the Plutonium Finishing Plant complex is leaking and on how much plutonium it contains.
- Hanford officials say a five-fold increase in tritium levels in groundwater is not the result of a leak from the K-Basins. They are still trying to determine the source. The increased tritium levels were found in a monitoring well about 50 feet north of the K-East basin, near the Columbia River. Examination of the basin has found no leaks.
- Energy Assistant Secretary Al Alm announces his resignation, effective at the end of January. He says the 2006 cleanup plan is now official policy.

National Dialogue

The idea of a "National Dialogue" on nuclear waste issues was first proposed in October 1995 by Washington Governor Lowry to DOE Assistant Secretary Grumbly. Lowry and others believed important DOE decisions about the management of nuclear materials and waste were being made on a piecemeal basis, and their overlapping impacts were not being considered.

A National Dialogue planning group met in 1996 and developed a proposal to conduct a method to: educate and inform stakeholders about issues associated with nuclear materials and waste; educate senior DOE decision-makers about regional and local concerns; develop consensus values and principles for DOE to consider in making decisions related to the management of these wastes; explore issues of equity and fairness; and build a sense of shared responsibility. It was believed the process would require a series of meetings and workshops, conducted over the course of a year or more.

In 1997 the National League of Women Voters asked for bids to pilot various workshop and meeting formats. A joint proposal submitted by the Washington League of Women Voters and the Oregon Department of Energy was accepted. Small discussion groups were conducted in Oregon in September 1997, and four regional workshops were conducted in October.

The League of Women Voters sponsored two national workshops in June 1998, but they fell far short of the original proposal.

October 1997 continued

"My vision of this approach derived not from political expediency or change for change's sake, but from a deep-rooted belief that we owe future generations a legacy of cleanup and completion, not generations of more cost and continued contamination." — Energy Assistant Secretary Al Alm. (Tri-City Herald, November 1, 1997).

"It's a hellish job and we liked Al. Hanford was a high priority for him...and he paid us a lot of attention. I liked the 2006 initiative. It was a sound, strategic concept, designed to strike for success early and show people we can make progress. But Al and I might be the only two people who feel that way." — Dan Silver, Washington Department of Ecology. (Tri-City Herald, November 1, 1997).

November 1997

- Both DOE's and Fluor Daniel's review of Fluor's first year at Hanford shows Fluor leadership hasn't been as strong as DOE had hoped. The reviews show Fluor was three percent over budget on cleanup projects and 28 percent of 1997's legal cleanup milestones were completed late or were undone.

"There have been a number of frustrations, and they've now been identified... And now we need to require Fluor to put corrective actions in place." — Washington Senator Patty Murray, who requested the reviews. (Tri-City Herald, November 6, 1997).

- DOE announces that Hanford's last untreated waste stream has been diverted to a disposal facility. It ends a ten year effort to stop the unpermitted dumping of liquids to the ground at Hanford.

"We have entered into a new era of waste management where past liquid waste disposal practices are replaced by state-of-the-art permitted facilities." — Liz Bowers, Manager of DOE's Liquid Effluents Program. (DOE News Release, November 10, 1997).

- DOE confirms that leaked tank waste has reached groundwater. Two draft Pacific

Northwest National Laboratory reports conclude leaked waste from five tank farms in the 200 West area have reached groundwater.

"It's nice to know we're now on the same playing field." — Suzanne Dahl, Washington Department of Ecology, referring to Ecology's past contentions that leaked tank waste has reached groundwater. (Tri-City Herald, November 26, 1997).



Workers at a Hanford tank farm.

December 1997

- Hanford is identified as a potential storage site for six metric tons of plutonium from Rocky Flats. DOE wants to move the plutonium as part of the accelerated cleanup at Rocky Flats.
- Rallies are held in Richland both in support of and in opposition to restart of FFTF.
- Waste levels in tank SX-104 drop two inches. DOE says the drop is because of changes in the barometric pressure.
- DOE approves a new cost estimate for the K-Basins project. The new estimate is \$1.08 billion, an increase of \$274 million over the previous estimate. The project is now also expected to take until 2003 instead of 2001.
- Fluor Daniel sends Duke Engineering a “cure” letter, outlining several concerns with their handling of the K-Basins project and implying they could lose their contract.

January 1998

- Public meetings are held to consider whether to remove milestones related to FFTF from the Tri-Party Agreement until after DOE decides the fate of the reactor. More than 8,000 comments are received, most opposing removal of FFTF milestones from the TPA.
- A DOE review of tank farm operations shows problems with morale, trust and communications. The review focused on DOE management issues and finds staff members believe protesting safety concerns to upper management will hurt their career.

“There’s been a lot of pressure to meet deadlines on budget...What has happened is the people end of relations has been shortchanged.” — Suzanne Rudzinski, DOE Headquarters review team leader. (Tri-City Herald, January 16, 1998).
- Hanford Site Manager John Wagoner announces that leaked tank waste from the B, BX and BY tank farms in the 200 East area has reached groundwater. This means that leaked waste from at least eight of Hanford’s 18 tank farms is believed to have reached the groundwater and could reach the Columbia River within 20 years.
- DOE announces it will develop a plan to address groundwater and vadose zone contamination. Bechtel is assigned the responsibility to integrate all work now being done on current cleanup activities. This includes sampling, data collection and modeling of soil and groundwater; pumping and treating contaminated groundwater; and research and technology development related to movement and containment of contamination.
- BNFL and Lockheed submit their proposals for constructing and operating tank waste treatment and immobilization facilities.
- Bechtel earns its best ever rating, and its seventh consecutive “outstanding” grade for the six month period ending September 30, 1997. Bechtel earned 92.73 percent of its performance fee. During the six month period, Bechtel’s accomplishments include closing out N Reactor, installing new pump and treat systems for chromium in the 100 K and 100 H areas, and C Reactor cocooning.
- An “alert” is declared at the site when a bottle of picric acid is found in a building in the 300 area. Emergency sirens sound to warn people in the area. An alert is the lowest of Hanford’s three emergency levels.

February 1998

- Nearly the entire Hanford Advisory Board signs a letter demanding the government take swift action to clean up Hanford’s tank waste.

“The federal government’s commitments to treating Hanford’s wastes have consistently been unfulfilled — treatment has always been delayed. Risk assessments have shown that both a catastrophic tank failure and continued leaking pose unacceptably grave risks to the health of Northwest citizens, the environment, and agricultural economy. Delays only increase these risks.” — Statement by the Hanford Advisory Board, February 19, 1998.
- Washington Governor Gary Locke tells Energy Secretary Peña that Washington is prepared to sue DOE for missing Tri-Party Agreement milestones. DOE has missed deadlines to begin pumping liquids from some single shell tanks, and faces a key deadline July 30 to award a contract to build a high-level waste vitrification plant.

“We are going to hold their feet to the fire....We don’t want their money or their fines. We want Hanford cleaned up.” — Washington Governor Gary Locke. (Tri-City Herald, February 24, 1998).

February 1998 continued

- DOE officials say funding projections for fiscal year 2000 fall \$80 million short of what they need to meet legal obligations.

"We are in trouble. We've missed milestones." — Hanford Deputy Manager Lloyd Piper. (Tri-City Herald, February 27, 1998).

- James Owendoff is named acting Energy Assistant Secretary for Environmental Restoration.

March 1998

- DOE releases its draft 2006 plan, re-titled "Accelerating Cleanup: Paths to Closure." The plan requests Congress appropriate \$5.75 billion a year, plus additional money for the privatization set-aside. This amount is \$3.5 billion short of funds needed through 2006 to meet all DOE cleanup obligations.



Retrieval of buried waste drums at Hanford.

- Ecology officials deny a DOE request to delay pumping eight tanks. Ecology previously denied a request to delay pumping six other tanks. DOE says tank safety issues have resulted in the delays and they are working on a detailed tank pumping plan.

"I think the state has made it very clear it intends to put pressure on us under the Tri-Party Agreement. We don't need this kind of encompassing pressure to do the right thing. We're already committed to doing it." — Hanford Manager John Wagoner. (Tri-City Herald, March 13, 1998).

- DOE declares an Unreviewed Safety Question for Tank SY-101 because of rising waste levels inside the tank. The tank contains 1.12 million gallons of waste which has risen nearly five inches during the past year.
- The House Commerce Committee's Oversight and Investigations Subcommittee launches an investigation into the K-Basin cleanup after project costs jump \$274 million and the completion date slips by 19 months.

- Public meetings are conducted on Hanford's fiscal year 2000 budget. Projections are that available funding will not be sufficient to meet cleanup deadlines under the Tri-Party Agreement.

"This is the place where there's tension between the funding we get and the laws we enforce." — Doug Sherwood, EPA. (Tri-City Herald, March 12, 1998).

- DOE Under Secretary Ernest Moniz says the expert panel on the SX Tank Farm will have an expanded role. Moniz wants the panel to also review efforts to track wastes under other tank farms. The expert panel is also advising Bechtel on how to coordinate Hanford's many vadose zone and groundwater sampling, analysis and treatment programs.

March 1998 continued

- DOE sends a letter to Fluor Daniel and Duke Engineering expressing strong concerns about problems at the K-Basins. The list of problems includes the inability to identify and correct problems, keep to a budget, and to lock in schedules and cost estimates.

"Not only is mitigation of an urgent risk to the Columbia River not being realized, but also other Hanford cleanup work is having to be deferred to cover cost increases for the (spent fuel program)... The project should be perceived as having a strong sense of urgency, but it does not. Delays occur, commitments are missed, but accountability does not appear to drive the management response."
— Letter from Charlie Hansen, DOE, to Fluor Daniel and Duke. (March 22, 1998).

- A GAO report says DOE's understanding of how waste moves through the vadose zone to the groundwater is inadequate to make key technical decisions on how to clean up wastes in an environmentally sound and cost-effective manner.

"There's no doubt there was little enthusiasm for this....The vadose zone is intellectually virgin territory." — DOE Under Secretary Ernest Moniz. (New York Times and Tri-City Herald, March 23, 1998).

- Ecology officials approve a four month extension to a Tri-Party Agreement milestone for work at N Reactor. More contamination was found than expected in the spent fuel basin.

"We've indicated to DOE that where (DOE) can make a good case for a delay, when we do see progress occurring, we are willing to consider a new schedule. Our concerns mostly focus on projects where nothing is getting done without a good reason."
— Sheryl Hutchinson, Ecology spokeswoman. (Tri-City Herald, March 27, 1998).

- DOE proposes a \$140,625 fine for Fluor Daniel, the largest fine ever levied against a Hanford contractor. Most of the fine is for poor handling of plutonium within the Plutonium Finishing Plant. The remainder of the fine covers emergency response problems during the May 1997 explosion in a chemical tank.

April 1998

- Excavation of a disposal site in the 300 Area is halted when several hundred barrels are found that are believed to contain uranium metal shavings. The disposal site operated from 1955 to 1961.



- Energy Secretary Peña announces his resignation, effective June 30.

"I am frustrated. Who do you call?"
— Washington Senator Patty Murray, referring to the numerous vacancies and acting positions at DOE. (Tri-City Herald, April 7, 1998).

- A decade long, \$48 million project to improve ventilation in four tanks is completed.
- An air sampler designed to detect tritium is turned off during a test in Hanford's 300 area, resulting in an unmonitored release.

Barrels containing oil with depleted uranium shavings discovered in Hanford's 300 Area.

April 1998 continued

- Fluor Daniel Hanford President Hank Hatch says the K-Basins project could be delayed up to three additional years and cost even more. Hatch says Fluor is disappointed with how Duke has responded so far to its “cure” letter.
- Representative Duncan Hunter of California, chair of the House National Security Committee’s defense procurement committee, considers cutting DOE’s environmental management budget by \$500 million. Such a cut could result in 1,250 layoffs at Hanford and slow or stop most cleanup work. Hunter is a critic of DOE’s cleanup efforts and believes defense programs have been cut too severely.

“It would be an abandonment of every commitment the United States government has made to the people of the state. It would be wholly unacceptable to us. There would be no other course but to seek relief from the courts.” — Dan Silver, Washington Department of Ecology. (Tri-City Herald, April 23, 1998).

“We’re putting at risk the Columbia River. The vitrification plant is not some hypothetical it-would-be-nice. It is, in fact, a necessity for us to move forward... hopefully in a timely way.” — Washington Attorney General Christine Gregoire. (Tri-City Herald, April 24, 1998).

- Representative Hunter meets with members of Washington’s Congressional delegation concerning possible cuts in DOE’s environmental restoration budget.
- Fluor Daniel President Hank Hatch announces his resignation. Ron Green, President of Fluor Daniel Power in Greenville, South Carolina is named to replace him.

“Change is never easy. Hank saw Fluor Daniel Hanford through the rocky start-up and difficult transition to the government’s new way of doing business at Hanford. It’s not been easy for any of us...and there have been many successes.” — Hanford Manager John Wagoner. (DOE News Release, April 28, 1998).

- Washington Governor Gary Locke writes to President Clinton and expresses concern about cleanup funding shortages.

“Hanford’s contamination and waste pose an ominous threat to the Columbia River and to the people of both Washington and Oregon. This is very much a public health issue as well as an environmental issue.” — April 30 letter from Washington Governor Gary Locke to President Clinton. (Tri-City Herald, May 19, 1998).

May 1998

- Representative Duncan Hunter says he will not make large cuts in DOE’s budget, but that DOE is unlikely to receive the full amount it requested for the privatization set-aside.
 - A moratorium on moving plutonium at the Plutonium Finishing Plant is lifted.
- “The PFP is definitely a safer place for workers today than it was 20 months ago.” — Larry Olguin, Fluor-Daniel Hanford project manager. (Tri-City Herald, May 9, 1998).*
- A team of 30 federal and state inspectors begins a “multi-media” investigation at Hanford to check for compliance with federal and state environmental laws. The investigation – by EPA and the Washington Departments of Ecology and Health – is the first to be conducted at Hanford.
 - During a House Subcommittee hearing, Hanford Manager John Wagoner says K-Basin costs may go up an additional \$276 million to almost \$1.4 billion, and completion may be delayed by two more years to 2005. In 1995, DOE estimated the cost at \$814 million and completion at 2001.

May 1998 continued

"An 84 percent cost overrun and a 19 percent probability of meeting the schedule... I do believe the wheels fell off."

— *Texas Representative Joe Barton, Chair of the Subcommittee. (Tri-City Herald, May 13, 1998).*

"I am willing to put every dollar, every bit of profit on that schedule. We are willing to live by it."

— *John Norris Jr., President of Duke Engineering and Services. (Tri-City Herald, May 13, 1998).*

- DOE proposes a four year delay in completion of its program to pump liquids from all single shell tanks.
- Fluor Daniel officials indicate to DOE that Duke has made enough progress at K-Basins to cancel the "cure" notice.
- DOE rejects Lockheed's bid for the vitrification privatization contract, saying its technical risk is unacceptably high. DOE continues to negotiate with BNFL.
- Talks break down on new K-Basin milestones in the Tri-Party Agreement. DOE will not yet commit to a schedule.

June 1998

- DOE confirms that radioactive waste in tank SX-104 has risen and fallen because of changes in barometric pressure, not leaks.

- The Environmental Protection Agency declares the 90,000-acre Wahluke Slope has no more significant environmental problems and should be removed from the national priority cleanup list for Superfund sites. It contained former anti-aircraft and missile sites used to protect Hanford during the Cold War.

"We've cleaned up all of the outlying areas of the site. I would not pretend these are the most significant or important portions." — *Doug Sherwood, Hanford Project manager for EPA. (Tri-City Herald, June 3, 1998).*

- The Defense Nuclear Facilities Safety Board accuses DOE of dragging its feet in cleaning up some of the most contaminated facilities at Hanford and other defense production sites. DOE officials reluctantly admit part of the problem is a lack of funding.

"It would not be forthright to sit here and tell you there are not funding challenges at Hanford." — *James Owendoff, Acting Energy Assistant Secretary. (Tri-City Herald, June 3, 1998).*

- Washington State officials announce they will sue DOE in 60 days for missing two deadlines for pumping radioactive wastes from Hanford's tanks. So far, 119 tanks have been pumped – leaving 29 of the most difficult with free liquids still remaining inside.

"Our patience has run out and the Department of Energy's credibility is wearing thin. We need them to meet milestones, and no more excuses." — *Ecology Director Tom Fitzsimmons. (State of Washington News Release, June 8, 1998).*

- Hanford contractors begin filling two waste trenches just north of the 300 Area with clean dirt. From 1975 to 1994, Hanford pumped one to 1.5 million gallons of contaminated liquids a day from the 300 Area's laboratory and nuclear fuel fabrication operations into the trenches. The water and other liquids contained uranium, cobalt, arsenic and PCBs. The trenches are 12 feet deep, 10 feet wide, 1,535 feet long and are just under one-quarter mile from the river.

"This was one of the big sources in the 300 Area for ground water contamination. This was one of the areas contributing a lot of uranium to the Columbia River." — *Bob McLeod, 300 Area project manager for DOE. (Tri-City Herald, June 10, 1998).*

June 1998 continued

- Ten Hanford workers are checked for possible exposure to organic chemical fumes. The incident occurs outside the Waste Encapsulation and Storage Facility when workers are preparing to get a test sample from a pipeline.



Filling waste trenches with clean dirt near Hanford's 300 Area.

- President Clinton nominates Bill Richardson, U.S. Ambassador to the United Nations and a former Congressman from New Mexico, as Energy Secretary.

"It seemed like DOE has been a political backwater for the second part of the Clinton administration. It's nice to see someone with a relatively high profile and knowledge of energy issues, considering he has (DOE) sites in his own back yard."
— Todd Martin, Hanford Education Action League. (Tri-City Herald, June 18, 1998).
- The League of Women Voters conducts workshops in San Diego and Chicago to bring together stakeholders from many DOE sites to discuss nuclear waste disposal and other related issues. The two workshops are considerably less than earlier proposals for a "National Dialogue" on nuclear waste. More than 70 citizen and environmental groups boycott the two workshops. A number of Hanford stakeholders participate in both workshops.
- A small amount of plutonium is found in the aquifer just north of the K-Basins, several hundred feet from the Columbia River. It is uncertain whether the plutonium has been there for years or is increasing. Hanford officials say while the plutonium could be left over from a past leak at the K-East basin, it's more likely

from Hanford's production days, when some waste water was poured into the ground.

- A DOE draft Environmental Impact Statement recommends against Hanford playing a role in disposing of the nation's weapons-grade plutonium. The study instead favors the Savannah River Site or the Pantex plant near Amarillo, Texas.

"The Energy Department determined that Hanford's cleanup mission is critical and should remain its top priority."

— DOE News Release. (June 23, 1998).

- Fluor Daniel Hanford earns only 55.3 percent of the total possible \$54 million it could have received for its first year of managing Hanford.

"I absolutely expected better. I know Fluor expected better." — Hanford Manager John Wagoner. (Tri-City Herald, June 25, 1998).

- The U.S. Senate approves a "Sense of the Senate" Amendment as part of the U.S. Senate's Defense Authorization Bill. It gives Senate backing that Oregon should remain strongly involved in Hanford issues.

"...Radioactive waste seeping through the soil or being discharged into the air recognizes no state boundary." — Oregon Senator Gordon Smith, in remarks to the U.S. Senate. (June 24, 1998).

- DOE approves a one year extension on Duke Engineering's Hanford contract to manage the K-Basins project. The project's estimated costs have risen from \$740 million in 1995 to \$1.4 billion and possibly more, while the expected completion date has slipped from 2001 to 2005.
- Ron Green resigns as president of Fluor Daniel Hanford after only a month and a half on the job. The resignation is effective immediately.

"I'm disappointed that a professional would take a position like that and then not carry out an assignment, saying 'No. I've got a better job.'" — Marilyn Reeves, Hanford Advisory Board Chair. (Tri-City Herald, July 1, 1998).

- DOE releases its “Accelerating Cleanup: Paths to Closure” plan for Hanford. The plan estimates Hanford’s cleanup costs through 2046 at \$50.8 billion in 1998 dollars or \$85.3 billion after factoring in inflation.
- The one millionth ton of waste is removed from a site near the Columbia River and deposited in the Environmental Restoration and Disposal Facility.



The one millionth ton of contaminated material is dumped at Hanford’s ERDF.

- Bechtel Hanford is awarded a three year contract extension. The contract’s fee structure is changed so it will be based 100 percent on performance.

“This extension clearly reflects the hard work of the team and its people. ... You managed to meet or beat every (Tri-Party Agreement) milestone.” — Linda Bauer, DOE’s assistant manager for environmental restoration. (Tri-City Herald, July 14, 1998).

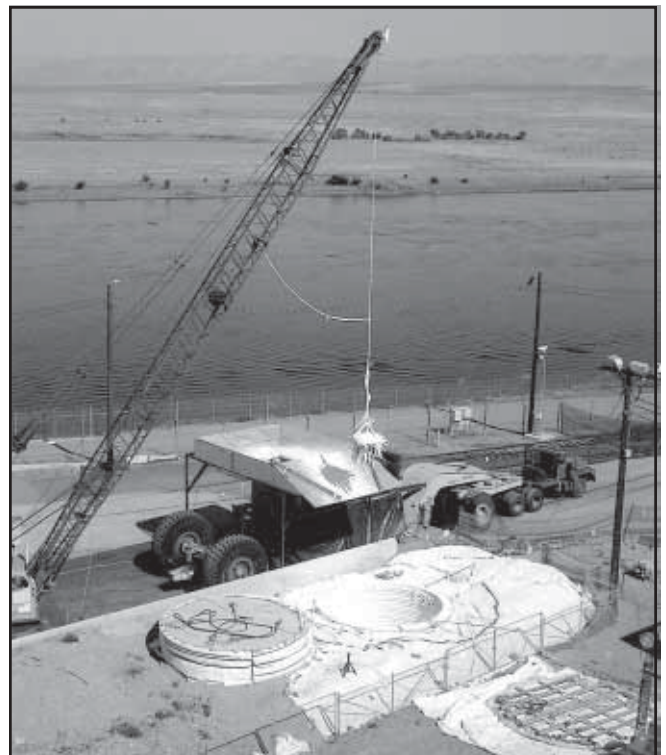
- A new federal study concludes FFTF can not meet the nation’s current demand for tritium.
- DOE sends a report to Congress on its proposed contract with BNFL to begin vitrification of Hanford’s tank waste. The proposal increases the cost and delays start-up, but the facilities will have much longer lives — 30 years instead of five to nine years — with more flexibility to expand over time. The estimated target price to build and operate high and low-activity waste plants is \$6.9 billion in 1997 dollars. The plants would begin glassifying wastes in 2006 or 2007. Waste from 11 of Hanford’s 177 tanks would be vitrified by 2018.

“We looked at some very fast-track schedules...But quite frankly, they presented a high risk. DOE could see it was not sensible to force a contractor to meet an unrealistic schedule.” — Maurice Bullock, President of the BNFL Team. (Tri-City Herald, July 22, 1998).

- Deactivation of the last of Hanford’s nine plutonium reactors — N Reactor — is finished eight days ahead of its revised schedule. Entrances to the contaminated areas and buildings have been closed off and most of the contaminated water and equipment removed.

“A lot of them worked themselves out of a job.” — Phil Staats, Ecology’s N Reactor area project manager. (Tri-City Herald, July 29, 1998).

- Ecology fines DOE, Fluor Daniel and Lockheed Martin \$75,600 for inadequate leak detection systems in the SY tank farm.
- The U.S. Senate confirms the nomination of Bill Richardson as Energy Secretary.



Removing radioactive fuel spacers from a storage silo was part of the deactivation of N Reactor.

August 1998

- Ecology officials announce that despite numerous concerns, they support the proposed Hanford tank waste glassification contract with BNFL Inc. Ecology wants guarantees in the Tri-Party Agreement that address those concerns.
- DOE signs a contract with BNFL Inc. to convert Hanford's tank waste into glass. During the initial 24-33 month period, BNFL will complete 30 percent of the facility design, obtain regulatory permits, and obtain financing.
- A Los Alamos study increases the estimates of leaks from four tanks in the SX tank farm. The revised leak estimates are 200,000 to 400,000 gallons of waste, about six times more than previous estimates. The report also estimates an additional one million curies of cesium from the four tanks entered the vadose zone. Previous estimates were that all leaked tanks had accounted for about one million curies of cesium.

September 1998

- Ron Hanson is named President and Chief Executive Officer of Fluor Daniel Hanford.
- DOE, Ecology and EPA agree on a cleanup timetable for the K-Basins. Workers will begin removing spent fuel from the basins by November 30, 2000. All fuel will be removed from the basins by December 31, 2003 and cleanup of the basins, including removal of sludge, debris and water, will be completed by July 31, 2007.
- Hanford's Waste Receiving and Processing facility receives start-up approval from DOE. It is the first operating facility in the DOE complex designed specifically to prepare transuranic waste for shipment to WIPP.
- B Plant is deactivated four years ahead of schedule and \$100 million under budget. The 800 foot long facility was built during World War II, closed in 1952, then reopened in the 1960s to separate cesium and strontium from tank wastes. The facility closed again in 1984. Nearly 2,000 cesium and strontium capsules will continue to be stored in an adjacent building. Annual maintenance costs for the facility drop from about \$20 million to \$750,000.



Washington Senator Patty Murray, Energy Secretary Bill Richardson, Hanford Site Manager John Wagoner and Deputy Site Manager Lloyd Piper celebrate the decommissioning of B Plant.

- Hanford's five pump-and-treat systems treated over 270 million gallons of groundwater during the past 12 months. The systems are designed to intercept and contain plumes of contaminated groundwater before they reach the Columbia River. They have been successful in removing strontium 90, carbon tetrachloride and chromium from the groundwater.

October 1998

- The 1100 Area is shifted from federal control to the Port of Benton. The site includes two large buildings, 24 smaller buildings, Stevens Drive and the southern portion of the Hanford railroad. DOE no longer needs the 768 acre area, which has been cleaned of contamination.
- A provision is inserted into the Defense Authorization Bill by Representative Doc Hastings to create a new Office of River Protection at Hanford, to direct cleanup of Hanford's waste tanks.

October 1998 continued

- The Washington State Pollution Control Hearing Board rejects DOE's year-old request to delay the pumping of tank C-106.
- Fruit flies are spreading contamination around offices and shops at Hanford. The fruit flies are apparently attracted to a sugary substance used to seal areas that may have radioactive contamination. At least 13 contaminated spots are found.
- Hanford is one of several potential sites being considered to manufacture plutonium 238 to power spacecraft, as well as a potential site to assemble the plutonium 238 batteries.
- A GAO report says the BNFL contract carries substantial financial risk for DOE. The GAO report also raises concerns about whether the vitrification technology BNFL has developed will work at Hanford.

"The revised approach represents a dramatic departure from DOE's original privatization strategy of shifting most financial risk to the contractor." — GAO Report. (GAO/RCED-99-13, October 1998).

- Hanford workers dig up more than 150 tons of waste contaminated with low-level radiation at the Richland city landfill. The trash was dumped there before officials knew flies and gnats were spreading radioactive contamination around offices and shops in the 200 East area.
- A GAO audit criticizes DOE for spending \$2.5 billion over the last decade on new technology

development for cleaning up its nuclear weapons sites but using less than one-fifth of the new technologies.

- Energy Secretary Richardson meets with Washington Governor Gary Locke and works out an agreement in principle to avoid a lawsuit by the State of Washington over DOE's delays in pumping liquids from Hanford's single shell tanks. DOE agrees to a consent decree filed in federal court, so that yet-to-be-determined schedules will be enforceable by a judge. DOE will pump the most dangerous tanks first.

"Obviously, disputes aren't going to get the job done." — Energy Secretary Bill Richardson. (State of Washington News Release, October 14, 1998).

"I think today shows that the Tri-Party Agreement works. It forced us to come together and work together." — Washington Senator Patty Murray. (Tri-City Herald, October 15, 1998).

- Energy Secretary Richardson visits C Reactor to celebrate completion of the reactor cocooning project. The cocooning involved removal of 23 of 24 reactor site buildings and construction of a new high-strength corrosion-resistant galvanized steel roof. Workers removed 70 tons of lead, 1,000 tons of steel, 12,000 tons of concrete and 1,700 tons of soil. More than 15,000 tons of low-level waste was sent to the Environmental Restoration Disposal Facility. The reactor will now sit for 75 years to allow the radioactivity to decay.



Washington Attorney General Christine Gregoire announces a tentative agreement with DOE over single-shell tank stabilization. Energy Secretary Bill Richardson, Washington Senator Patty Murray and Washington Governor Gary Locke look on.

October 1998 continued

"The Hanford skyline has been forever changed, and will change even more based on the success of this project." — Hanford Site Manager John Wagoner. (DOE News Release, October 14, 1998).



People who lived downwind of Hanford are now able to provide personal information about their diet and where they lived and request an estimate of how much radiation they likely were exposed to from radioactive iodine 131 released to the air from Hanford between 1944 and 1957. The Hanford Individual Dose Assessment Project will provide a free estimate of how much radiation dose people's thyroid gland received.

Before and after photos show the dramatic changes at C Reactor following successful cocooning of the former plutonium reactor.

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November 1998

- Estimates to clean up the K-Basins rise to \$1.59 billion.
- DOE begins waste removal tests at tank C-106, but suspends work after about two hours because of higher than expected exhaust emis-

sions. Eleven workers are examined after potential exposure to the emissions.

- About 200 people show up at a DOE hearing to support or oppose the idea of creating plutonium 238 for the United States' space program in FFTF.

December 1998

- Energy Secretary Richardson announces Hanford Manager John Wagoner will retire in January. James Hall, the Manager of Oak Ridge, is named acting manager.

"In searching for John's successor, we will be looking for an individual who understands the cleanup challenges of the Hanford Site, who will keep our commitments to protect the Columbia River, the community and our workers, and who will work in partnership with the state, EPA and Tribal Nations to meet our cleanup obligations under the Tri-Party Agreement. In the short time we've worked together, I've been impressed by John's mastery of the issues, and his professionalism in what I consider to be one of the most important and difficult jobs in the

DOE complex." — Energy Secretary Bill Richardson. (DOE News Release, December 3, 1998).

"This has been the toughest, most rewarding challenge of my career. I'm proud of the work we've done...and the new programs we've launched to attack the problems efficiently and effectively." — Hanford Manager John Wagoner. (DOE News Release, December 3, 1998).

- Randy Smith, manager of EPA's regional Superfund program, ends 12 years of involvement in Hanford issues as he moves to a different EPA program. In his final day on the job, Smith shares his observations about Hanford, its problems, and the progress that's been made during those 12 years.

December 1998 continued

"I think we all find Hanford overwhelming...When you're out on the site, you feel an overwhelming sense of the grandeur of the land, and when you're at the river, you feel the power of the river...The scale of the environmental damage that we have done at the Hanford Site is just amazing. And the challenge to try to remediate that is huge...Although we cannot say for many of the wastes at Hanford that we have really remediated the damage and that we are as far along as we need to be, we are nevertheless, much better off than we were in the mid-80s." — Randy Smith, EPA. (December 5, 1998).

- The Washington Department of Health orders a temporary halt to work in a 300 area laboratory after a larger-than-planned release of tritium into the air. The release did not exceed allowable limits under the state's permit, but was considerably higher than expected. Pacific Northwest National Laboratory officials are investigating the cause of the release.
- DOE officials say they still do not know the cause of a one and a half inch drop in the level within a Hanford waste tank. Waste levels in Tank B-111 have remained stable since the drop in September. Meanwhile, the waste level in tank SY-101 continues to rise – some 14 inches since last December.

- DOE reaches a settlement with environmentalists to end a nine year old lawsuit filed by the Natural Resources Defense Council and 38 other environmental groups. DOE will provide \$6.25 million for citizen groups to monitor and finance independent technical studies of DOE's waste management programs.
- DOE removes 18 tanks from the organic complexant watch list (eight of these are also on the hydrogen watch list) and closes the safety issue related to organic complexants. The action leaves 28 tanks remaining on the watch list.

"Resolving this safety issue moves us closer to our goal of resolving all high-priority safety issues at Hanford." — James Owendoff, Acting Energy Assistant Secretary. (DOE News Release, December 17, 1998).

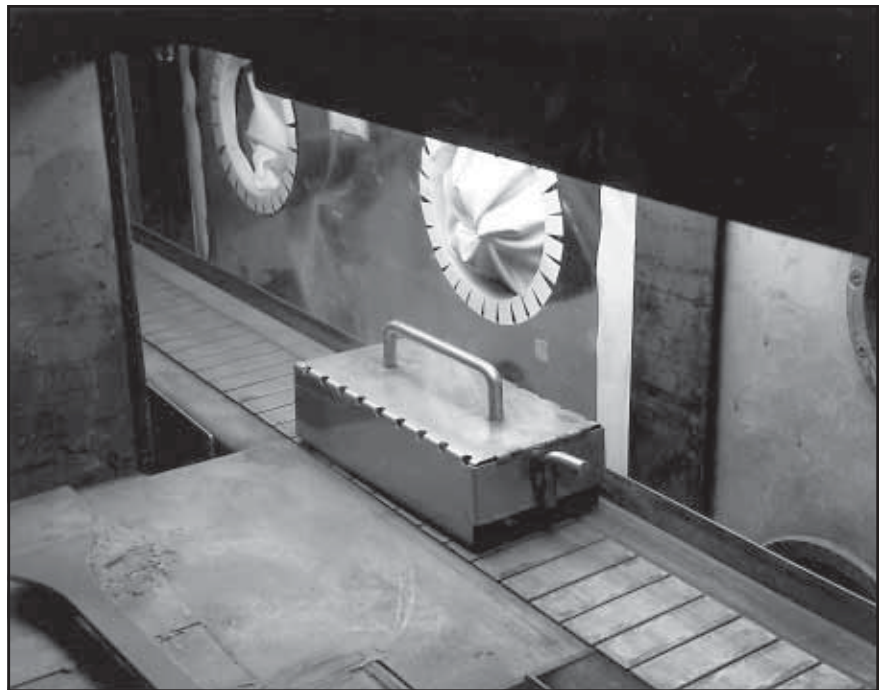
- Energy Secretary Richardson announces FFTF will not be used for tritium production. Potential other missions for the reactor will be decided in the spring of 1999.

"After examining the different options, I have decided that the Fast Flux Test Facility will not play a role in producing tritium." — Energy Secretary Bill Richardson. (DOE News Release, December 22, 1998).

January 1999

- John Wagoner retires as Hanford Manager. Jim Hall, the Manager at Oak Ridge, takes over as acting manager.
- President Clinton nominates Carolyn Huntoon as DOE Assistant Secretary for Environmental Management. She is a former director of the Lyndon B. Johnson Space Center.
- Washington denies Hanford's request to reduce a \$110,000 fine for a 1997 explosion at the Plutonium Finishing Plant.
- After a two year suspension, DOE resumes stabilizing plutonium at the Plutonium Finishing Plant. Fifteen corrective actions were resolved during that time. The stabilization process converts plutonium to a safer form for long-term storage. The plant holds 4.3 metric tons of scrap plutonium.
- Researchers from the Fred Hutchinson Cancer Research Center and the Centers for

Plutonium-bearing materials are moved on a conveyor inside the Plutonium Finishing Plant.



Disease Control and Prevention release draft results from the Hanford Thyroid Disease Study. The study finds no evidence that any kind of thyroid disease increased as a result of exposure to radioactive iodine released into the air from Hanford from 1944 to 1957. The study results are sharply criticized by downwinders and others. Later, CDC officials say the study results also do not prove that a link does not exist.

February 1999

- DOE submits to Congress its FY 2000 cleanup budget request for Hanford. The \$1.17 billion request is an increase of \$70 million over Hanford's 1999 cleanup budget, but still \$23 million short of meeting all Tri-Party Agreement obligations. DOE also requests \$106 million in set-aside for Hanford's tank waste vitrification program.
- The Hanford Advisory Board urges DOE and its regulators to agree to cleanup milestones that comprehensively regulate cleanup at the Plutonium Finishing Plant. The Board says PFP's plutonium represents one of Hanford's greatest risks to Hanford workers, the public and the environment.
- EPA fines DOE \$367,078 in civil penalties, primarily for storing dangerous waste without a permit. Seventeen drums containing solvents were stored outdoors – some for as long as three years – without a permit. DOE is also cited for failing to identify two containers of waste as hazardous.

February 1999 continued

- Nuclear Regulatory Commission (NRC) officials say no major obstacles have been uncovered that would prevent the NRC from regulating DOE nuclear facilities. The NRC disputes conclusions made last fall by the Defense Nuclear Facilities Safety Board that external regulation of DOE facilities would be too costly or would undermine national security. The NRC and the DOE are conducting a pilot program to test the effectiveness of outside regulation.
- DOE projects that level funding in Fiscal Year 2001 will leave the agency \$232 million short of meeting its legal obligations for cleanup. If so, programs to remove contaminated soil from the Columbia River and cocooning old reactors would take the hardest hits. There is also increasing concern about the privatization set-aside. The preliminary request is \$606 million. In the past three years, Congress has authorized only \$385 million in set-aside. Since construction is scheduled to begin in 2001, a large increase in the set-aside is mandatory to keep the program on schedule.

"Unfortunately, I think 2001 is the year that the train wreck is actually happening" to cleanup. — Mike Wilson, Ecology. (Tri-City Herald, Feb 26, 1999).

Hanford Budget

	Environmental Management Portion of the Budget	Total Hanford Budget
FY 1989	\$ 263 million	\$ 897 million
FY 1990	\$ 494 million	\$1.154 billion
FY 1991	\$ 867 million	\$1.434 billion
FY 1992	\$1.116 billion	\$1.456 billion
FY 1993	\$1.462 billion	\$1.749 billion
FY 1994	\$1.497 billion	\$1.851 billion
FY 1995	\$1.453 billion	\$1.852 billion
FY 1996	\$1.354 billion	\$1.703 billion
FY 1997	\$ 925 million*	\$1.535 billion
FY 1998	\$1.099 billion*	\$1.576 billion
FY 1999	\$1.104 billion*	\$1.566 billion
FY 2000	\$1.160 billion	\$1.497 billion
FY 2001	\$1.697 billion	\$2.087 billion
FY 2002	\$1.887 billion	\$2.329 billion
FY 2003	\$2.009 billion**	\$2.503 billion
FY 2004	\$2.013 billion	\$2.030 billion***

* A set-aside for the tank waste privatization contract was also funded during FY 1997-99. The amount of set-aside was \$170 million in FY 1997, \$115 million in FY 1998 and \$100 million in FY 1999.

** Beginning in FY 03, included funding for the Fast Flux Test Facility from Environmental Management.

*** Beginning in FY 04, Pacific Northwest National Laboratory funding transferred to Office of Science.

March 1999

- DOE, EPA and Ecology reach agreement on a court-enforceable schedule for pumping liquid waste out of 29 single shell tanks. The agreement comes eight months after Washington announced its intent to sue DOE. Following a public comment period, language in the Tri-Party Agreement will be replaced with a consent decree filed in federal court. Under the new schedule, 98 percent of the remaining six million gallons of liquid waste will be pumped by September 30, 2003. The remainder will be pumped within an additional year.

"This new schedule sets strict, realistic deadlines for dealing with the most volatile and dangerous threats to the

Columbia River without further delay." — Washington Attorney General Christine Gregoire (State of Washington News Release, March 3, 1999).

- Hanford officials announce plans to pump about 100,000 gallons of waste from tank SY-101 this fall. The action is in response to a rise in the waste level in the tank of about 25 inches in the past two years. The pumping will lower the level of waste in the tank by about three feet. Hanford scientists believe tiny gas bubbles collect in the foam beneath the surface crust. The foam then cools and creates additional crust.

March 1999 continued

- Hanford officials may be on the verge of eliminating a long-standing problem with tank C-106. Wastes in the tank generate heat and require the addition of water to cool the waste and keep it from damaging the tank structure. Because of leaks from other Hanford tanks, there has been considerable concern about adding water to the tank. About 22,000 gallons of waste was pumped from C-106 to an adjacent tank, A-102. The ventilation system in A-102 can cool the waste without adding water. Hanford officials plan a month of study to see the affect of the pumping on both tanks. After those studies are complete, another 30,000 gallons of waste will be pumped to A-102, which officials believe will then result in the wastes in C-106 no longer requiring cooling water.
- Operation of the new cross-site waste transfer line begins. About 750,000 gallons of waste is to be moved from a tank in the 200 West area to the 200 East area. This will free up double shell tank space in the 200 West area needed to pump waste from single shell tanks. It also frees up space for the planned transfer of waste from tank SY-101 later this year.
- Keith Klein is named DOE's new Hanford Site Manager. Klein has been the Acting Manager for DOE's Carlsbad, New Mexico office since October, and prior to that spent four years as Deputy Manager at Rocky Flats. Energy Secretary Richardson also appoints Richard French as Manager of the Office of River Protection. French was General Manager and President of Kaiser Engineers Hanford from 1988-1994, and spent 14 years prior to that at the Idaho National Engineering Laboratory. He has run his own engineering and construction management company since 1994.

"As the Richland Manager, Keith will bring to the position an outstanding combination of technical

The first load of transuranic waste arrives at the Waste Isolation Pilot Plant in New Mexico.

depth, diverse career experience, problem solving and communication skills, and academic credentials. He is the right person for one of the Department's most challenging jobs." — Energy Secretary Bill Richardson. (DOE News Release, March 23, 1999).

"(French) is a hands-on, results-oriented manager with an outstanding record of achievements. Dick knows Hanford and is ready to meet the challenges of cleaning up Hanford's tank waste and protecting the Columbia River." — Energy Secretary Bill Richardson. (DOE News Release, March 23, 1999).

- DOE and Ecology reach a settlement concerning leak detection systems in the double shell tanks. DOE agrees that all 28 double shell tanks will be equipped with a complete leak detection system by December 31, 1999. That system will include three leak detector probes between the walls of each tank, and at least one surface level monitor in each tank. Ecology will waive a \$75,600 penalty if DOE meets the terms of the settlement.
- After more than a decade of legal, political and regulatory delays, the Waste Isolation Pilot Plant receives its first shipment of transuranic waste. The waste came from Los Alamos National Laboratory.



March 1999 continued

- Congress approves a \$53.3 million internal transfer of Hanford money. The action prevents layoff of several hundred Hanford workers.
- The Spokane-based Hanford Education Action League (HEAL) closes its doors. HEAL was one of the most influential citizen groups on Hanford issues since it was founded in 1984, but in recent years has seen its membership fall to 250 and has had difficulty raising funds.
- An advisory committee recommends to Energy Secretary Richardson that DOE conduct a detailed environmental study to determine whether to restart the Fast Flux Test Facility. After considerable debate, the Nuclear Energy Research Advisory Committee supports an environmental impact statement to examine possible missions and waste streams for the reactor. Secretary Richardson is to announce his decision in April.

April 1999

- Former Hanford Manager Mike Lawrence is named to head up BNFL's tank waste glassification program. The change is effective April 15.
- Environmental restoration work begins at H Reactor. Contaminated soil and other materials is being removed from old liquid waste disposal sites and hauled to the Environmental Restoration Disposal Facility. Meanwhile, cocooning of F and DR reactors continues on a steady pace.
- Energy Secretary Richardson, during a brief Hanford visit, says DOE will retain ownership of the 140 square mile Wahluke Slope, and the U.S. Fish and Wildlife Service will manage the slope as a wildlife reserve. The action will help protect the Hanford Reach, the last free-flowing stretch of the Columbia River.

"We're giving back to the people of this community and state a legacy for the future. By protecting the Wahluke Slope, we're protecting the river. I am convinced my proposal is the correct one. If we do not act to protect it now, it

will change for all time." — Energy Secretary Bill Richardson. (Tri-City Herald, April 11, 1999).

"Some days, (the river) speaks to me. Some days, it whispers to me. Some days, it cries out in pain. Today, it sings to me."

— Rich Laeumont, Lower Columbia Basin Audobon Society. (Tri-City Herald, April 11, 1999).

- DOE releases the draft Hanford Remedial Action Environmental Impact Statement. The draft explains six scenarios for future use of Hanford's 560 square miles of property after they are cleaned up. DOE's recommendation



*The Hanford Reach
of the Columbia River.*

April 1999 continued

calls for wildlife reserves at the Fitzner-Eberhardt Arid Lands Ecology Reserve, the Wahluke Slope, the Hanford Reach, Gable Mountain and Gable Butte. Industrial development would be limited primarily to the 200 Areas and to southeastern Hanford. The other recommendations range from one which would make nearly the entire site a wildlife reserve, to others which would allow greater industrial development and allow some farming.

- DOE announces low-activity vitrified waste produced during the first stage of the tank waste treatment program will be disposed in four empty grout vaults in Hanford's 200 East area. The vaults were constructed in 1990 and 1991 for disposal of low-activity waste that had been converted to grout. That program has since been discontinued and the low-activity waste will instead be vitrified. Additional low-activity waste will be disposed either in new vaults or new waste trenches.

May 1999

- Keith Klein takes over as DOE's Hanford Site Manager.
- Energy Secretary Richardson announces a 90-day study of the Fast Flux Test Facility. The study will examine possible research and other needs for the FFTE, alternatives for meeting those needs and details for a future mission and operation of the facility. If the study demonstrates a compelling need for FFTE, DOE will proceed with an extensive environmental study to further examine re-start of the reactor. If a compelling need is not identified, Richardson

will order permanent closure of the facility.

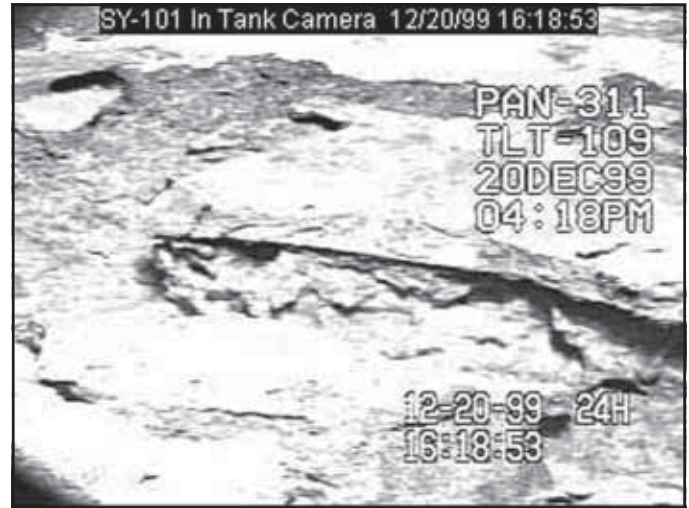
"Taxpayers have already invested nearly a billion dollars in the Fast Flux Test Facility. We need to respond to that investment by making the best decision on the use of this facility."

*— Energy Secretary Bill Richardson.
(DOE News Release, May 4, 1999).*

- Hanford marks the tenth anniversary of the signing of the Tri-Party Agreement.

May 1999

- Hanford workers successfully release some of the hydrogen gas trapped beneath the crust in tank SY-101. Workers use a mechanical arm to open holes in the nearly 90-inch thick crust.
- DOE issues a civil penalty of \$330,000 to Fluor Daniel Hanford for violating nuclear safety requirements. Energy Secretary Richardson also issues a compliance order – the first by DOE – with specific milestones to ensure corrective actions are taken. DOE investigators found contractors at Hanford’s spent fuel project repeatedly failed to follow the procedures in their own safety plans.



The crust inside tank SY-101.

June 1999

- Over a few week period, Hanford workers successfully pump out more than 55 vertical inches of waste from tank C-106. Radioactive decay currently heats the waste, forcing Hanford workers to add water to the tank for cooling. Although the tank is not suspected of having leaked, Hanford officials want to avoid having to add water, should the tank begin leaking in the future. Waste is being moved to a double-shell tank, AY-102, which has a more efficient ventilation system.

“Hanford’s High-Heat Safety issue is nearing resolution.” — Dick French, DOE Office of River Protection Manager (DOE News Release June 8, 1999).

- Fluor Daniel Hanford pays a \$330,000 fine to DOE out of its corporate funds. It is the largest fine DOE has ever levied against a Hanford contractor.

July 1999

- DOE adds the K-Basin spent fuel project to a special “watch list” of troubled DOE projects, in which DOE officials will enact tighter management controls and adopt a harder line in dealing with both contractors and its own staff. Three other DOE projects — two at Los Alamos and one at Savannah River — are also placed on the list.
- Congress confirms Carolyn Huntoon as Energy Assistant Secretary for Environmental Management.
- A GAO report says DOE’s cleanup program

will be short of funds by about half a billion dollars each year through 2006, jeopardizing DOE’s plans to clean up most of its smaller sites by 2006.

- Hanford officials are looking at the possibility of disposing of sludge from the K-Basins at the Waste Isolation Pilot Plant (WIPP), instead of adding it to Hanford’s underground tanks. Hanford workers will consider whether they can put the sludge in drums, remove all liquids, solidify it with cement, and ship it to WIPP.

July 1999 continued

- DOE's Inspector General says DOE is wasting \$12 million in its work along the Columbia River. The report says cleanup to unrestricted use standards is unnecessary, as land use plans call for limited recreation, hunting and fishing by American Indians, a museum at the site of B Reactor and wildlife preservation. The report draws sharp criticism.

"Continuing to support cleanup objectives that are inconsistent with projected land uses unnecessarily increases restoration costs." — DOE Inspector General Report DOE/IIG-0446. (June 1999).

"This is an indication of the arrogance from the Department of Energy in blowing off state standards and local, tribal and community-based input. From the state's point of view, the standard ought to be strict. When you limit cleanup, you limit future land use." — Max Power,

Washington Department of Ecology. (Tri-City Herald, July 9, 1999).

- The GAO says DOE's organization is too complicated to effectively manage all its programs, including environmental cleanup. The report says changes are needed to clear up a complex and jumbled chain of command and some of DOE's missions should be shifted to other agencies. The report says that of DOE's 80 biggest projects from 1980 through 1996, 31 were terminated before completion at a cost of \$10 billion.

"DOE's long-standing failures in managing major environmental cleanup projects also illustrate the need to fundamentally change how DOE operates...Indeed, now is an ideal time for reconstructing DOE into a more manageable agency," — GAO Report (GAO/IT-CRED-99-255, July 13, 1999).

August 1999

- An experiment designed to dilute chromium now seeping into salmon beds appears to be successful. Sodium dithionite is pumped into the contaminated groundwater once a month. The chemical converts the chromium into a less mobile and benign form. After six months of this experiment, tests have shown the chromium levels drop considerably once they pass through the test area. The project may be expanded to address a large chromium plume coming from the D Reactor area, and may be tested on other chemical plumes.
- Negotiations on setting new Tri-Party Agreement milestones for tank waste treatment are suspended and expected to resume in mid-September at a higher level.
- The 200 foot tall stacks at D and DR reactors are dynamited as part of the cocooning of the two reactors.
- Nearly two million pages of once-classified material have been declassified at Hanford during the past ten years. More than 12,000 declassified documents have been posted on the internet.

- Energy Secretary Richardson announces that DOE will conduct an Environmental Impact Statement to review impacts associated with operating the Fast Flux Test Facility. The EIS will evaluate the environmental effects associated with a range of possible uses of the reactor, including medical isotope production and producing plutonium-238 to power spacecraft.



Energy Secretary Bill Richardson at Hanford.

September 1999

- A DOE Headquarters inspection team says Hanford's K Basins project finally appears to be on track. However, past problems used up nearly all of the extra time available in the project schedule and additional delays will likely result in missing Tri-Party Agreement milestones.
- DOE announces that three monitoring wells in north Richland show increased concentrations of radioactive tritium. The readings are still well below federal drinking water standards, but DOE officials could not explain the reason for the increase. Additional samples will be taken to try and determine the reason for the increase or to find out if the problem was caused by a sampling or laboratory error.
- A robot inspects the inside of Hanford's U plant. The robot travels through a ventilation tunnel, collecting radiation samples and shooting video. Less contamination and more dust than expected is found during the robot's five hour trek through the 800 foot-long facility. The robot may be used to look inside some of U plant's processing cells, which are believed to be heavily contaminated.
- Energy Secretary Richardson and the governors of Washington, Colorado, Tennessee and South Carolina sign an agreement in principle, pledging they will work together to help DOE keep its cleanup efforts on track, including lobbying Congress for sufficient cleanup funding. The governors also agree to cooperate with each other on nationwide cleanup issues, such as the transportation of radioactive waste between sites in their states. Richardson promises "substantial, specific progress" in treating and immobilizing Hanford's tank wastes.

"It's always important to get the top guy's name on the line...but the proof will be in the pudding. We've had a long relationship with Energy that hasn't always been fruitful, and we hope these meetings bear fruit." — Sheryl Hutchinson, Ecology spokeswoman. (Seattle Post-Intelligencer, September 11, 1999).
- The Hanford Advisory Board issues its 100th piece of advice.
- DOE announces that stabilization of plutonium-bearing liquids is underway at the Plutonium Finishing Plant. The process converts the liquids to a more stable powder suitable for long-term storage.
- DOE announces an effort to accelerate retrieval of aging spent fuel from the K-Basins. Two key processing systems – the fuel retrieval and water treatment systems – will be tested by the end of December.

"I'm not content to be on a track that just barely meets schedule if everything goes according to plan." — Hanford Site Manager Keith Klein. (DOE News Release, September 23, 1999).
- Regulatory oversight of the K-Basin cleanup is shifted to the U.S. Environmental Protection Agency.
- DOE declares the criticality issue in the tank farms resolved. Uncertainties in the quantity and distribution of fissile materials in the tank waste prompted the safety issue to be declared in 1992.
- DOE releases its final environmental impact statement on proposed land uses for Hanford following cleanup. DOE's preferred option is to limit industrial development to southeastern Hanford and the 200 Areas. Following extensive public comments this summer, DOE recommends expanded protection for some areas —making national wildlife refuges of the Wahluke Slope, the Fitzner Eberhardt Arid Lands Ecology Reserve, and Hanford's northwestern corner. Some mining and recreational uses would also be allowed. DOE examined six proposed scenarios, some of which differed greatly. Benton, Franklin and Grant counties favored extensive agriculture and grazing on parts of the Hanford Site, while the Nez Perce Tribe recommended making almost the entire site a wildlife preserve.
- DOE takes core samples of sludge from Tank 241-Z-361, a small tank next to the Plutonium Finishing Plant. The tank's 20,000 gallons of sludge is believed to contain about 66 pounds of plutonium. No new waste had been added to the tank for about 20 years, and it was nearly forgotten about until a 1997 chemical explosion at PFP forced DOE to assess all potential risks at the complex. Tests have shown flammable gases are

September 1999 continued

not building up inside the tank and DOE believes the chances of a criticality are low. The tank is also not believed to be leaking.

- Hanford Site Manager Keith Klein announces a new management structure for the site, which he says will eliminate filters between DOE and its contractors. The new DOE management structure will have two deputy managers reporting directly to Klein. Bob Roselli will oversee support func-

tions, ranging from budgeting to site security. Another deputy manager — yet to be hired — will oversee cleanup work.

“What you’re seeing here is the start of a score card to measure progress.”

— Keith Klein, Hanford Site Manager.
(Tri-City Herald, October 1, 1999).

October 1999

- The first few hundred individual radiation dose estimates are mailed to people who lived downwind of Hanford between 1944 and 1957. About 10,000 people have so far provided information about where they lived and what they ate to the Hanford Individual Dose Assessment Project, the first step in calculating estimated radiation doses from iodine 131 released to the air during Hanford’s early years of operations.

- Ultrasonic testing shows signs of corrosion on the inner wall of one of Hanford’s double shell tanks. The corrosion consists of tiny pits, about 0.1 inch deep within the half-inch thick wall. The corrosion is found in tank AN-105, which contains 1.16 million gallons of waste.

- Most liquids and sludges are removed from tank C-106, Hanford’s lone high heat tank. The wastes were pumped to a double shell tank which has a ventilation system which can cool the waste without adding water. Because of the problems associated with the tank’s waste, the tank was used to demonstrate the ability to pump sludge, not just liquids.

“This tank has been an on-going source of concern for a long time and it’s a big relief for all of us to finally have it emptied,”
— Suzanne Dahl, Washington Department of Ecology. (DOE ORP News Release, October 5, 1999).

- A Fluor Daniel worker is burned with sulfuric acid in a 200 East Area facility. The worker is in serious condition with burns on her face and an arm at Seattle’s Harborview Medical Center. She

was doing routine work in Hanford’s Liquid Effluent Facility when a joint in a nearby pipeline failed or came loose and sprayed sulfuric acid.

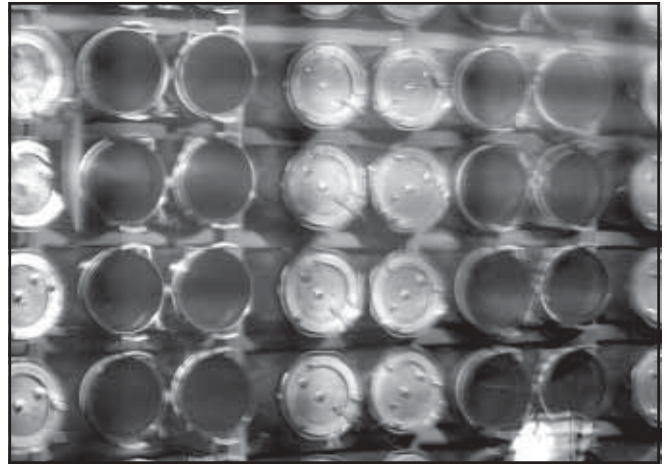
- High concentrations of technetium are found in a 200 West Area aquifer. The readings come from a well about 220 feet deep and less than 20 feet from Tank SX-115, a single-shell tank built in the mid 1950s and found to be leaking in 1965. The level of technetium 99 found in the well is 34,000 picocuries per liter of water, about 38 times the federal drinking water standards. A Washington Department of Ecology engineer says the worst-case scenario would have the technetium reach the Columbia River within 20 years.
- More than 1,000 people attend scoping meetings in Seattle, Portland, Hood River and Richland. The meetings are conducted to consider the possible use of the Fast Flux Test Facility to produce medical isotopes and plutonium 238 for space craft batteries.
- A GAO report says Hanford is doing a better job of managing the K-Basins project. The report does express concerns about whether Hanford will be able to meet the schedule to begin moving spent fuel out of the K West Basin by November 2000. The report praised the work of Fluor Daniel Hanford at resolving outstanding technical issues, but cautioned that little planning has been done to continue and eventually complete the work after fuel removal begins.

“Compared with conditions that we reported on in May of last year, the amount of progress is substantial, with considerable construction completed and

October 1999 continued

equipment installation under way. Nonetheless... operational readiness issues have become major challenges, and most of the extra time built into the schedule for addressing contingencies has already been used up.” — GAO Report (GAO/RCED-99-267, September 1999).

“As far as GAO reports go, this is the most positive I’ve ever seen.” — Phil Loscoe, DOE’s acting director for the K-Basins project. (Tri-City Herald, October 21, 1999).



Spent fuel canisters in the K-West basin.

November 1999

- The Clinton Administration adds the 138 square mile Wahluke Slope to the Saddle Mountain National Wildlife Refuge. The action is aimed at protecting salmon habitat. DOE will continue to own the land, but it will be managed by the U.S. Fish and Wildlife Service.
- DOE completes construction of the Cold Vacuum Drying Facility, meeting a Tri-Party Agreement milestone. It is the key processing facility in DOE’s program to dry and repackage aging spent fuel stored in the K-Basins.
- CH2M Hill announces it is buying Lockheed Martin Hanford Corporation. Lockheed Martin’s 1,158 employees are in charge of maintaining Hanford’s tanks plus conducting work to prepare the waste for treatment by BNFL. No major changes are immediately planned for Lockheed’s operations.

December 1999

- Keith Klein appoints Harry Boston as Deputy Manager for Site Transition. Boston will manage most of Hanford’s cleanup programs, including the spent fuel project, environmental restoration and waste management, and facility stabilization. Boston is a Vice President for Lockheed Martin Hanford Corporation, managing Hanford’s underground storage tanks.
 - DOE announces that Hanford and the Nevada Test Site are its preferred choices for disposal of mixed low-level and low-level wastes from other DOE sites. A final announcement is expected in January. How much waste could come to Hanford is not yet clear. State officials say they oppose the plan, unless they can get some assurances that Hanford’s cleanup – especially tank waste treatment – moves forward, perhaps on an expedited schedule.
- “We’re going to be protesting this vigorously...I don’t know how the federal government can place a new mission on Hanford unless it has really addressed the current one.” — Washington Governor Gary Locke. (Associated Press, December 11, 1999).*
- “I hope the state would use anything within its arsenal to gain some leverage, before any additional wastes hit this site, to get the necessary support for what we need out here.” — Ken Bracken, Hanford Advisory Board co-vice Chair. (Tri-City Herald, December 11, 1999).*

December 1999 continued

- DOE lifts a compliance order against Fluor Daniel Hanford. The order, issued in May, required Fluor to make specific improvements and complete corrective actions in how it operates the spent nuclear fuel program.
- A National Research Council Review of the Hanford Thyroid Disease Study finds that the study was basically sound, but that the conclusiveness of the findings were overstated. Downwinders criticized draft conclusions of the study announced in January, which said there was no evidence thyroid disease increased as a result of Hanford's radioactive emissions.

"The study results are sufficiently consistent to indicate that there is no large risk of thyroid cancer or other thyroid diseases associated with the Hanford fallout, although the study probably cannot rule out a small risk, or perhaps a risk among some subgroup of especially susceptible persons...We believe the study's investigators incorrectly assumed that exposure estimates calculated for each person were more precise than they actually were."
— Roy Shore, National Research Council. (Tri-City Herald, December 15, 1999).

- Tank farm workers move 90,000 gallons of waste from tank SY-101 to an adjacent tank. This is the first step towards permanently resolving safety issues associated with the tank for more than a decade. Hydrogen generation within the waste caused concerns of a fire or explosion in the early 1990s. That problem was alleviated by installation of a mixer pump in 1993. The mixer pump, however, caused the crust on top of the waste to grow to about 10 feet in thickness, threatening to overflow the tank. About 90,000 gallons of water was added to replace the waste pumped out and to dilute the approximately 1.1 million gallons of waste that remain in the tank. Levels in the tank dropped about two feet as gas trapped in the crust was released. More waste will be pumped from the tank at a later date.



Hanford's mixed low-level waste burial trenches.

"This alleviates one of the most hazardous problems in the tank farm and proves we can retrieve waste to send to a (treatment) plant...It's the single most complicated technological piece of work (we have) done, and we've done it practically flawlessly." — Fran DeLozier, president of Lockheed Martin Hanford Corp. (Tri-City Herald, December 22, 1999).

"The burping issue has been put to rest, and the crust issue has been put to rest."
— Tony Valero, project manager for tank waste storage for the Washington Department of Ecology. (Tri-City Herald, December 22, 1999).

- ATG begins processing mixed waste from Hanford at its new non-thermal mixed waste processing facility in Richland. ATG is using supercompaction and macroencapsulation technologies. After treatment, the waste will be returned to DOE for disposal. Operation of its thermal treatment facility is expected to begin in mid-2000.
- Tank C-106 is removed from the Wyden "watchlist." Radioactive decay of waste in the tank had generated high heat, requiring the addition of cooling water. The issue was resolved in October when sludge in the tank was pumped to another tank with a better ventilation system. C-106 was the only tank on the watchlist because of high heat generation.

January 2000

- Two Hanford workers are slightly contaminated after tank waste leaks during the pumping of tank S-103 in the 200 West Area. About five gallons of highly radioactive tank waste comes up through an electrical conduit and spills onto the ground.
- Two Tri-City legislators introduce a bill to exempt tank waste treatment facilities from local property taxes. The legislation could cut costs of the project by as much as \$1 billion. But Benton County officials say the county will need revenue to supply services to the new workers and their families who are expected to be part of the project. BNFL Inc. officials, who will build and operate the plants for the Department of Energy, had assumed the facilities would automatically be exempt from property taxes because they would be operated for the government on government land.
- Sixty gallons of water contaminated with radioactive waste spill during a test of an underground pipe. The pipe was to be used to pump high-level waste from tank U-109 – a single-shell tank – to a double-shell tank. The pipe had been flushed with water but still contained residual waste.
- A new Defense Nuclear Facilities Safety Board (DNFSB) report says work at Hanford and other DOE sites “does not reflect the urgency that the circumstances merit.” The report addresses recommendations made in 1994 for cleaning up plutonium. The DNFSB acknowledges some progress, but says severe problems – especially funding – continue to impede cleanup. The report to DOE Secretary Richardson suggests he advise Congress and the President of the funding problems, then prioritize tasks according to potential safety risks.

The Savannah River Site is listed as having the three most urgent problems, followed by concerns over converting plutonium solutions into stable forms both at Savannah River and at Hanford’s Plutonium Finishing Plant.

“The issue is they’d like to see us do it faster. We concur. We’d like to see it done faster, too.” — Harry Boston, DOE’s deputy manager for site transition at Hanford. (Tri-City Herald, January 25, 2000).

- The federal government concedes that workers in America’s nuclear weapons production facilities were exposed to radiation and chemicals that caused cancer and early death. A draft report prepared by DOE and the White House concludes radiation exposure led to higher-than-normal rates of a wide range of cancers among workers at 14 nuclear weapons plants, including Hanford. The admission — after decades of denials — raises the prospect of compensation to affected workers and their families.

“This is the first time that the government is acknowledging that people got cancer from radiation exposure in the plants.” — Energy Secretary Bill Richardson. (New York Times, January 29, 2000).

- Ecology Director Tom Fitzsimmons asks EPA to join with Ecology in developing and issuing a Final Determination relating to Tri-Party Agreement milestones for the tank waste treatment program. DOE and Ecology — after more than a year of negotiations — reach their January 31 deadline for concluding the negotiations without an agreement.

February 2000

- EPA agrees to join Ecology in issuing a final dispute determination on Tri-Party Agreement milestones for the tank waste project.

“You can count on our assistance and full support...It is appalling that after 18

months of negotiations we don’t have agreement on a program to address what certainly is one of the nation’s most severe environmental problems...it is simply beyond reason to ask EPA and Ecology to

February 2000 continued

accept an arrangement under which the regulatory agencies will be forced to watch and wait, with no real ability to assess real-time progress, until some distant milestone is missed before they can take action...The conduct of DOE Headquarters during the tank waste treatment negotiations has been nothing short of irresponsible.” — Letter from Chuck Clarke, EPA Regional Administrator, to Ecology Director Tom Fitzsimmons. (February 3, 2000.)

- High concentrations of tritium – 400 times higher than drinking water standards – are found in a monitoring well next to a Hanford burial ground. A new sample was prompted by high readings taken in January 1999, but only recently acknowledged as being of concern. The well is adjacent to the Energy Northwest’s WNP-2 reactor complex. The burial ground – called 618-11 – was used from 1962 to 1967 to dispose of radioactive waste, some of which was so radioactive that it could only be handled with remote-controlled equipment. Samples taken on January 27, 2000 show tritium levels in excess of 8 million picocuries per liter (pCi/L), among the highest tritium levels found away from Hanford’s 200 areas. The 1999 sample showed levels of 1.8 million pCi/L. More sampling is scheduled throughout the area, to try and determine the size of the tritium plume.

- The State of Washington will continue to negotiate with DOE over Tri-Party Agreement milestones for the tank waste treatment program, rather than impose its own schedule. After 18 months of negotiations, DOE and the state have yet to agree on milestones for constructing and operating vitrification facilities to treat the high-level waste in Hanford’s 177 underground storage tanks. The major holdup is DOE’s unwillingness to have interim construction milestones between the start of construction in 2001 and the start of operations in 2007. DOE officials say they need flexibility to renegotiate some points in the coming years when it has better information on project costs and technology.

- A DOE Inspector General’s Office report says Hanford’s tank waste treatment program needs better long-range planning and coordination. Hanford officials say they identified those problems some time ago and are working to address them. The report shows significant improvements since a previous review in 1993, but did list several concerns. Among those were BNFL’s ability to complete 30 per cent design of the treatment facilities by this August; what it called an “unrealistic” deadline of 2028 to treat all of Hanford’s tank waste; and a lack of available tank space.

“The magnitude and complexity of this project make it unique among challenges facing the Department of Energy. In fact, this project dwarfs most others... However, without a complete and integrated planning, budgeting and management approach to the tank waste remediation project, the Department may be unable to control, predict, explain or defend future changes to cost and schedule.” — DOE Inspector General Report (DOE/IIG-0456 January 2000).



The dark shaded rectangle near the bottom center of the photo is the 618-11 burial ground. Energy Northwest’s WNP-2 reactor complex is adjacent to the burial ground. Two unfinished nuclear reactors are at the top-middle of the photo, with the Columbia River in the background.

February 2000 continued

"(The Inspector General's Office) forgot to say that management here already knows this and is doing something about it."

— Dick French, Manager of DOE's Office of River Protection. (*Tri-City Herald*, February 12, 2000).

- As expected, Hanford and the Nevada Test Site are chosen by DOE as disposal sites for low-level and mixed low-level waste from throughout the DOE complex. The announcement comes three days before a scheduled meeting between Washington Governor Gary Locke and Energy Secretary Bill Richardson in which Locke is expected to say Washington will file suit to stop such shipments unless it can get

additional guarantees that treatment plants are built at Hanford to immobilize the site's high-level waste. Locke wants to tie the two issues together legally so the state can threaten to stop importation of low-level wastes if DOE lags behind on building the vitrification facilities.

- Additional sampling of groundwater near a Hanford burial ground finds no elevated tritium levels beyond what was found in one well in late January. After readings of 8 million picocuries per liter of tritium were found in the well near an old burial ground, additional samples were taken from 21 other wells in the area. While tritium was detected in many of the other wells, it was at levels previously documented at being below 55,000 picocuries per liter.

March 2000

- Hanford workers complete the final waste transfer from tank SY-101. About 286,000 gallons of waste is pumped from the tank in the latest transfer and more than half a million gallons overall. The pumping was done to resolve flammable gas hazards and growth of the tank's crust.

"What was once Hanford's biggest headache has become our biggest success."

— Dick French, Manager of DOE's Office of River Protection. (*Hanford Reach*, March 13, 2000).

- EPA assesses \$55,000 in penalties against DOE for poor waste management practices at the U Plant.
- The Washington Legislature passes a bill to exempt Hanford's tank waste treatment facilities from local property taxes. The bill could save about \$1 billion from the cost of the project. The property tax exemption won't take effect until 2006, allowing local jurisdictions to collect about \$49 million in taxes in 2003, 2004 and 2005. Those taxes would be used to help pay for increased services the project will demand.
- Hanford's spent nuclear fuel project completes installation of all necessary equipment to begin

cask loading and handling operations in Hanford's K-West Basin. Workers are scheduled to begin moving spent fuel out of the K-West Basin in November.

"We now have all the hardware needed to move the cleaned and repackaged spent fuel from the K-West Basin into the Cold Vacuum Drying Facility, and then on to the Canister Storage Building for dry interim storage." — Phil Loscoe, DOE (*DOE News Release*, March 13, 2000).

- Unless additional money is allocated for Hanford, the fiscal year 2002 cleanup budget is expected to fall \$357 million short of meeting legal obligations. Hanford officials say they will fight for increased funding before the budget is officially proposed next February.
- The State of Washington extends a deadline by two weeks to try and resolve a dispute over setting enforceable milestones for the tank waste treatment program. The process has reached a point where Ecology Director Tom Fitzsimmons is prepared to set these milestones without DOE's agreement, which DOE could then appeal. Energy Secretary Richardson's staff is preparing a new offer to the state.

March 2000 continued

- DOE asks Congress for an additional \$9 million to maintain the Fast Flux Test Facility. The additional money – if approved – will not be enough to maintain full staffing at the reactor, and some staff will need to be transferred to other jobs. The current environmental study underway on possible restart of the reactor may also need to be scaled back.
- Energy Secretary Richardson says DOE officials will meet with British investigators to explore BNFL's problems associated with falsifying documents related to the production of plutonium fuel. In addition to its work at Hanford, BNFL is also involved with nuclear waste cleanup at several other DOE sites.

"We are now placing BNFL under extra scrutiny because of these problems... Business as usual is over with BNFL and with all our contractors, but especially with BNFL."
— Energy Secretary Bill Richardson (New York Times, March 22, 2000).

- A coalition of watchdog groups asks Secretary Richardson to bar BNFL from any government contracts, including a contract to vitrify Hanford's tank wastes.

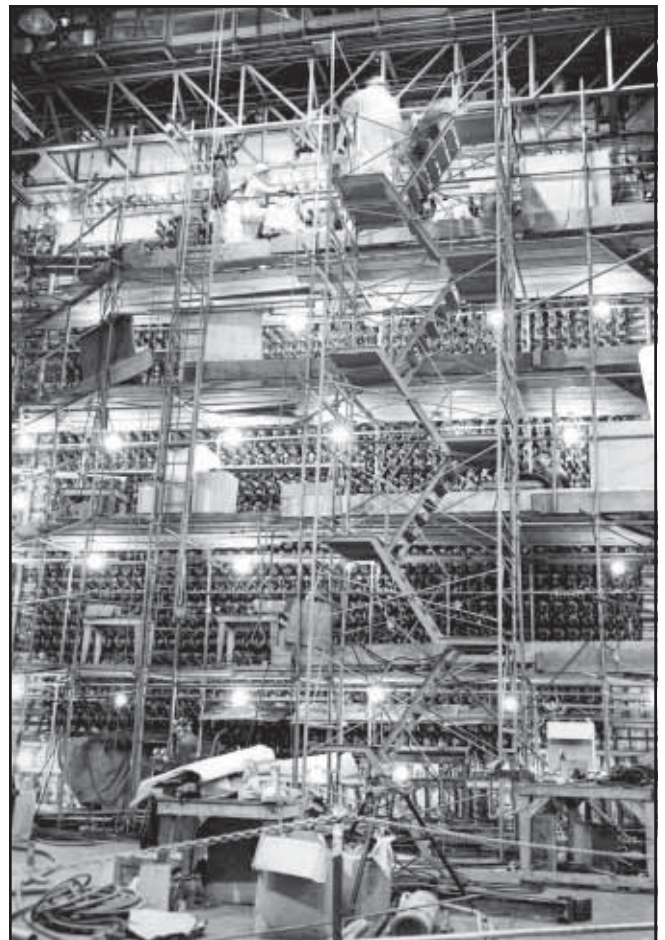
"The fear is that this is a company that only cares about dollars and doesn't care about how it gets there. I think it is a character issue and an ethics issue." —Tom Carpenter, Government Accountability Project. (Tri-City Herald, March 23, 2000).

"...we welcome these additional reviews. If they help ease DOE's concerns as to our technical and operational capabilities, and move us beyond the misinformation campaigns of the special interest groups, it will be a positive step in finally moving these major projects to actually cleaning up the legacy wastes of the Cold War."
— (BNFL News Release, March 23, 2000).

This photo, showing construction of the DR reactor face, is one of the thousands of declassified photos from Hanford's early years.

- Hanford workers complete pumping of Tanks T-104 and T-110. All liquid waste in the 40 tanks in the T, TY and TX tank farms in the northern 200 West Area have now been pumped. Half of these tanks are suspected leakers. This is the first Hanford tank farm complex to have all pumpable liquids removed. Liquids have now been pumped from 122 of Hanford's 149 single shell tanks.
- DOE's Pacific Northwest National Laboratory is declassifying 50,000 photograph negatives taken at/or around the Hanford Site from 1943 to 1967. The photos chronicle the building of the Hanford Engineer Works as part of the Manhattan Project and provide historical insight into the early communities of Hanford, White Bluffs, Pasco and Richland.

"Much has been said about the incredible technical feats of the Manhattan Project, but these pictures show the human side of the story." — Kim Engle, PNNL (DOE News Release, March 23, 2000).



March 2000 continued

- DOE officials say the presence of small amounts of PCBs in Hanford's tank waste could add \$1.5 billion to the cost of building and operating treatment facilities. DOE and its contractors are trying to determine whether the amount of PCBs in the waste will cause the treatment process to fall under regulatory requirements of the Toxic and Substance Control Act.
- The Defense Nuclear Facility Safety Board says bulging plutonium canisters stored at Hanford's Plutonium Finishing Plant may rupture and leak. Such an incident could contaminate workers and the storage vault, tremendously slowing efforts to convert more than four tons of scrap plutonium into a more stable form for long-term storage. Extensive cleanup was required in 1969 and 1970 after two cans leaked plutonium into the storage vault. The DNFSB says Hanford has been negligent in checking the stored cans.
- Ecology Director Tom Fitzsimmons issues a "final determination" – setting milestones and enforcement policies for the construction and operation of tank waste treatment facilities. Fitzsimmons' action comes after more than 18 months of negotiations failed to reach a cleanup schedule that both the state and DOE could agree on. The biggest disagreement was related to enforcement of the Tri-Party Agreement. The state wants to be able to take enforcement action as soon as it becomes clear a milestone cannot be met, rather than having to wait for the milestone to actually be missed. This is especially important in the tank waste project when milestones for construction are several years apart. DOE had insisted they needed more flexibility to deal with unforeseen funding or technical problems. Both sides agree on the basic schedule: DOE signs a contract with BNFL by August 31, 2000; construction begins by July 31, 2001; operational testing of the pre-treatment and vitrification facilities begins by December 2007; commercial production of the facilities begins by December 2009; and 10 per cent of the tank waste is to be treated by December 2018. Both sides agree to wait until this fall to set two interim construction milestones. Fitzsimmons also issues a

inventory of Hanford's hazardous and mixed wastes and developing a plan for treating and disposing all wastes not currently covered under the Tri-Party Agreement. The determination gives DOE until April 2001 to accomplish these activities. DOE has until April 28 to accept or appeal the state's determinations.

*"It's time to end the debate and focus our attention on getting the cleanup done."
— Tom Fitzsimmons, Ecology Department Director. (Ecology News Release, March 29, 2000).*

*"It is disappointing to say the least that DOE has failed to move forward in the retrieval of wastes from its failing (single shell tanks), to construct and operate a tank waste treatment complex, or to otherwise comply with federal and state hazardous waste law as they pertain to DOE's Hanford site tank wastes. DOE has ignored...tank waste requirements after approving them, has repeatedly changed course...and continues to argue for... terms which would not hold it accountable to comply with the law."
— From Ecology's Final Determination. (March 29, 2000).*

*"It's imperative that we all work to ensure cleanup commitments are based on realistic expectations and work collaboratively to adjust commitments to reflect budget and technical realities."
— Keith Klein, Hanford Site Manager. (DOE News Release, March 29, 2000).*

- Washington Governor Gary Locke signs into law a bill which will exempt Hanford's planned tank waste treatment facilities from property taxes.
- Eleven current or former Hanford employees file suit in connection with a 1997 chemical tank explosion at Hanford's Plutonium Reclamation Facility. The lawsuit accuses four Hanford companies and Kadlec Medical Center in Richland of failing to provide proper medical care to the workers and claims the workers were harassed after the incident.
- Ecology notifies DOE of its intent to take enforcement action for failing to complete integrity assessments of six Hanford double shell tanks.

"Considering the importance of the double-shell tank system, we were particularly disappointed with the poor effort by the USDOE to ensure the system will remain fit for use." — Bob Wilson, Ecology Senior Compliance Inspector. (Ecology News Release, April 5, 2000).

- The Clinton Administration announces plans to compensate nuclear weapon production workers at Hanford and other sites who were exposed to radiation and chemicals while helping build America's nuclear weapons arsenal. DOE routinely opposed worker compensation claims based on supposed radiation exposure. Under the new plan, compensation payments of up to \$100,000 will be made to workers with certain cancers – or their survivors. There will also be a package of benefits available which include medical costs and lost wages. The plan must still be approved by Congress.

"The government is done fighting workers, and now we're going to help them. We're reversing the decades-old practice of opposing worker claims and moving forward to do the right thing." — Energy Secretary Bill Richardson. (The New York Times, April 12, 2000).

"No amount of compensation will bring my dad back. But this may be able to help some other people who are sick - who are going through what we went through." — Jim Williamson of Kennewick, whose father, Jack — a Hanford worker — died about six months ago. (Tri-City Herald, April 12, 2000).

"For decades, government ignored mounting evidence that workers who were contributing to our nation's defense were themselves being put at risk. While we cannot undo their suffering, today this administration begins the process of healing by admitting the government's mistakes, designing a process for compensating these workers for their suffering and by becoming an advocate for Department of Energy workers throughout the nuclear weapons complex." — Vice President Al Gore. (DOE News Release, April 12, 2000).

"We haven't made thousands and thousands of people sick. But there are hundreds, and we are opening the door wider to make sure we get everyone." — David Michaels, DOE Assistant Secretary for Environment, Safety and Health. (Tri-City Herald, April 13, 2000).

- Cost estimates to build and operate facilities to immobilize Hanford's tank wastes may climb as high as \$13 billion – seriously jeopardizing the project. BNFL has been working since 1998 to develop cost estimates and design plans to construct facilities to treat Hanford's tank waste. The previous cost estimate had been \$6.9 billion. BNFL officials say they are confident the construction and operating costs will be about \$6 billion. The cost of financing could increase the total costs to nearly \$13 billion. BNFL is still exploring ways to reduce the financing costs and hopes to bring the total cost down to \$9 or \$10 billion when they submit

April 2000 continued

their formal offer to DOE on April 24. DOE and state officials are stunned by the new estimates.

"We seriously underestimated the costs. It was the best (estimate) we had, but we were wrong...That doesn't excuse that we gave an estimate that is too low. We've got enough information now to know that this is a price that DOE cannot afford." — Mike Lawrence, General Manager, BNFL Hanford. (Tri-City Herald, April 12, 2000).

"Doing it at the (original) numbers we have now is pretty heavy lifting. Doing it at these new numbers is impossible." — Dick French, Manager of DOE's Office of River Protection. (Seattle Post-Intelligencer, April 13, 2000).

- Mike Lawrence resigns as General Manager of BNFL's Hanford project.

"Recent events put me in the position of having to explain and defend actions both before I came to the project and since November for which I did not have responsibility or authority. I cannot in good conscience continue to be a figurehead and mouthpiece for a project for which I do not have responsibility and authority." — From Mike Lawrence's resignation letter. (Tri-City Herald, April 14, 2000).

- Updated costs to clean up DOE's nuclear weapons complex rise 44 percent since the last estimate two years ago. DOE now estimates it will need \$151 billion to \$195 billion through 2070. Seventeen of the 113 sites nationwide will take as much as a decade longer to clean up, while DOE hopes to finish work at five sites more quickly than earlier forecast. Cost estimates for the Hanford cleanup rise slightly, from a 1998 estimate of \$54.8 billion to a new estimate of \$55.6 billion. The estimated end of the cleanup in 2046 is unchanged.

- For the fourth consecutive year, Energy Secretary Bill Richardson and Secretary of Defense William Cohen certify to the President that the nation does not need to resume nuclear tests to maintain the safety, security and reliability of America's nuclear weapons stockpile. It has been almost eight years since the last U.S. underground nuclear test.
- DOE Deputy Secretary T.J. Glauthier says DOE is determined to keep Hanford's tank waste treatment project on schedule – despite indications BNFL's estimated cost to begin the project may have doubled to \$13 billion. After BNFL submits its proposal, DOE will have two months to determine whether to approve it, and another two months to sign a contract. DOE is studying potential backup plans to keep the project on schedule if BNFL's proposal is rejected.

"I don't want to abandon that possibility (of using BNFL). Their credibility is damaged. But their credibility is not totally gone...We want to give them a chance to convince us. If (BNFL) is widely off the mark, we'll know in the first few days." — DOE Deputy Secretary T.J. Glauthier. (Tri-City Herald, April 21, 2000).

- BNFL's submits its formal cost estimate to begin treatment and vitrification of Hanford's tank waste. BNFL admits the price of \$15.2 billion – based on 100 per cent private financing – is likely not affordable.

"Few people now believe this is the right way to finance this job. Under the present scheme, the cost of private capital is contributing about half of this total. The biggest opportunity (to reduce costs) is to re-examine how we can reduce the financing burden, while retaining the benefits of the privatization approach." — Paul Miskimin, President and Chief Executive Officer of BNFL Inc. (BNFL Inc. News Release, April 24, 2000).

April 2000 continued

- Energy Secretary Bill Richardson says DOE will not approve BNFL's \$15.2 billion proposal. In a written statement, Richardson says the price is unacceptably high and not fundable. He directs Deputy Secretary T.J. Glauthier to lead an evaluation and report back by May 15 on available options – including the use of other contractors – to proceed with tank waste cleanup.

"This is the latest development in a disturbing trend of unacceptable and unexplained budget escalation. As a result, DOE is now evaluating possible alternative approaches including recompeting to seek other contractors." — Energy Secretary Bill Richardson. (April 26, 2000).

May 2000

- Hanford's evaporator eliminates about 700,000 gallons of liquid from the double shell tanks, reducing the volume of contaminated liquid to about 53 million gallons.
- Energy Secretary Richardson announces he will terminate the BNFL privatization contract at Hanford for design, construction and operation of vitrification facilities to immobilize Hanford's high-level tank waste. DOE will seek new bidders and award a new contract by the end of the year to complete the design work and construct the facilities. The current design team will continue in the interim to avoid future delays. DOE Deputy Secretary T. J. Glauthier says BNFL's design work appears sound, and the project likely will use BNFL's designs. DOE will reimburse BNFL for its expenses so far – estimated at about \$200 million to \$300 million. Glauthier said the privatization approach - under which BNFL was to pay all upfront costs and be repaid only when glass is produced - will be totally or partly eliminated.

"BNFL's proposal was outrageously expensive and inadequate in many ways. We will start competition for a new contract right away...and conduct business so we should be able to meet our long term schedules for operating a waste treatment plant." — Energy Secretary Bill Richardson. (DOE News Release, May 8, 2000).

"While disappointed that the Department of Energy has decided to recompetete the entirety of the contract, we are pleased that they have determined that the design and technical solution is sound, and will

be the basis for proceeding with the cleanup of the Hanford tanks." — (BNFL News Release, May 8, 2000).

- DOE officials say they intend to meet the current schedule to construct Hanford's tank waste treatment facilities, even though they are now without a lead contractor to do the work, following announcement of DOE's intent to terminate its contract with BNFL. BNFL's partner, Bechtel, will continue design work through December 15. DOE will issue a request for proposals to finish the design and to build the plants. The new agreement will no longer require private financing, although DOE might see if some private money could still be invested in parts of the project. Dick French, Manager of DOE's Office of River Protection, says the new company can submit its own design or continue with BNFL and Bechtel's design.
- DOE Secretary Bill Richardson meets with Washington Governor Gary Locke and Attorney General Christine Gregoire in an attempt to keep Hanford's tank waste vitrification program moving forward. Richardson agrees to immediately amend a current consent decree to require DOE to meet milestones to replace



DOE Office of River Protection Manager Dick French.

May 2000 continued

BNFL. Under the agreement, DOE will agree to issue a request for proposal by August 2000 for a new contractor to design and construct Hanford's tank waste treatment facilities, and to award a contract by January 15, 2001. Richardson also agrees that DOE will enter into negotiations to seek agreement on a consent decree to govern the operation of the tank waste treatment facilities. A consent decree is a legal agreement. It will allow the state to take a case of a missed deadline directly to a federal judge for a ruling.

"Secretary Richardson assures us that the vitrification plant will be up and running in 2007, and that must be our focus."

— Washington Governor Gary Locke. (State of Washington News Release, May 10, 2000).

"Washington residents are hostages. Fifty-four million gallons of nasty stuff is in 177 tanks in our back yard. We get the rhetoric and the excuses. We get the song and the dance. Hanford is supposed to be cleaned up by 2046 at a grand total of \$56 billion. What's that — 101 years after the end of World War II? We are hostages, but Congress writes the checks and increasingly has every reason not to be amused... Progress, on an admittedly difficult and obviously lucrative job, has been zip. What if Congress refuses to write more checks?" — (Seattle Times Editorial, May 17, 2000).

- A DOE report says no hazards are imminent at Hanford's Plutonium Finishing Plant that could lead to a criticality accident. Other plutonium facilities at Rocky Flats, Savannah River, Oak Ridge and Los Alamos received similar critiques. DOE had reviewed criticality safety at five of its sites following a September 1999 criticality accident in Japan which eventually



Workers inside Hanford's Plutonium Finishing Plant.

killed two workers. DOE's report suggests some training and procedural changes to further reduce the risk of a criticality accident from occurring.

- DOE and EPA officials say planned treatment of Hanford's tank waste should also take care of PCBs in the waste. Recent concerns were that a separate treatment process might be necessary to deal with the cancer-causing PCBs. That additional treatment was estimated at \$1.5 billion.

"I do not believe that tank waste PCB issues are a legitimate basis for funding delays or schedule delays." — Chuck Clarke, EPA Northwest Regional Administrator. (DOE Office of River Protection News Release, May 17, 2000).

- Energy Secretary Bill Richardson says DOE will demand the right in future contracts to fire the contractors' top managers and control the managers' bonuses. In addition, the Energy Secretary will review decisions on what goals to set for contractors and whether the contracting companies have met those goals and should earn bonuses. DOE administers more than 30 management contracts, worth more than \$50 billion in the next decade.

May 2000 continued

"I'm trying to end the cozy relationship between the department and its contractors. The department has not exercised proper oversight and it needs to get tougher." — Energy Secretary Bill Richardson. (New York Times, May 19, 2000).

- DOE cites Bechtel Hanford for violating nuclear safety requirements. DOE proposes a civil penalty of \$82,500 for the violation, which occurred in June 1999 at the B Reactor. Three workers were exposed to airborne radioactivity after workers unwrapped a highly contaminated filter press and failed to post warning signs. The problem was not discovered for at least 13 days.
- DOE announces it is seeking "Expressions of Interest" from companies interested in designing and constructing Hanford's tank waste treatment facilities.
- The Washington Department of Ecology notifies DOE's Office of River Protection that it is not satisfied with the pace of the single-shell tank waste retrieval program. Ecology says the program is under-funded and has not pursued retrieval technology development with sufficient vigor.

"...movement of (single-shell tank) waste into (double-shell tanks), and ultimately into the treatment facility, must be accomplished as soon as physically possible. I have not observed this level of urgency in USDOE's current planning and funding

scenarios...It is a disappointing pattern at Hanford that just as a technology appears ready for deployment...the budget is slashed and the project is cancelled." — Letter from Ecology's Suzanne Dahl to ORP, May 31, 2000.

- Interior Secretary Bruce Babbitt recommends the Hanford Reach be designated a national monument. The action will preserve about 200,000 acres of undeveloped federal lands along the Columbia River.

"These are priceless natural landscapes that have somehow remained almost untouched by exploitation, development and urban sprawl. Protection of several of these areas, in one form or another, has been discussed for years, but no action has been taken. We may not have another chance before they are lost ..." — Interior Secretary Bruce Babbitt, on national monument status for the Hanford Reach and three other areas of the country. (Tri-City Herald, June 1, 2000).

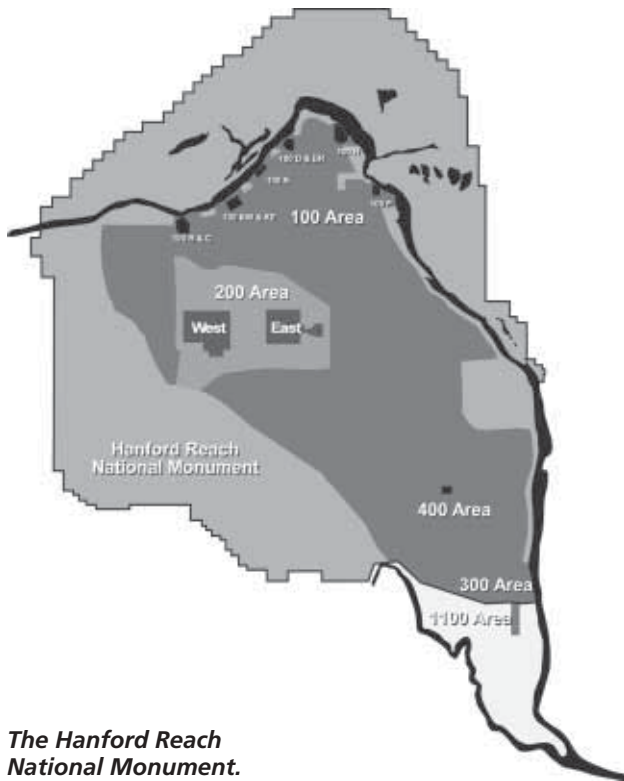
"In one fell swoop, this administration is destroying years of negotiations, shutting out the concerns of local people and blowing any chance of protecting the Reach in a manner that accommodates the needs of all parties." — Washington Senator Slade Gorton. (Tri-City Herald, June 1, 2000).

June 2000

- The Tri-Parties agree to eleven new Tri-Party Agreement milestones for the K-Basins project. Under the new schedule, sludge removal will begin in 2002 and end in 2004, about the same time that fuel removal is also scheduled to be complete. The overall completion date moves up by one year.
- President Clinton names the Hanford Reach as a National Monument area. The Reach Monument forms a giant "C" shape around central Hanford. The monument includes the Arid Lands Ecology Reserve, the Saddle Mountain National Wildlife Refuge, and areas along the Columbia River north of Richland. Clinton also

June 2000 continued

directs that “objects of scientific and historic interest” on the rest of the Hanford site be protected. This may result in eventually adding lands to the monument as Hanford is cleaned up.



The Hanford Reach National Monument.

■ Ecology levies a \$200,000 fine against DOE for failing to complete assessments of Hanford’s double shell tanks. The Tri-Party Agreement required DOE to complete an integrity assessment by September 30, 1999 to determine the structural condition of the tanks. Ecology determined that DOE did not perform all the planned assessments. Ecology officials say while there is no indication that any double-shell tank currently is leaking, a full integrity assessment is vital to ensure successful cleanup of tank wastes. DOE officials say some of the assessments were deferred to focus resources on resolving safety issues associated with tanks C-106 and SY-101. In addition to the fine, DOE was ordered to completely examine the entire double-shell tank system by March 2006, with significant portions of the work to be completed by the end of this year. If work is completed on time, the penalty will be cut in half.

■ DOE completes the first shipment of contaminated debris from the K-Basins to the Environmental Restoration Disposal Facility. The

shipment includes three tons of old fuel canisters and construction debris.

- A GAO report says DOE has so far been unsuccessful with its attempts at privatizing some of its cleanup work. The GAO reviewed three DOE privatization projects – the tank waste treatment program at Hanford and two projects at the Idaho National Engineering and Environmental Laboratory. The GAO found common problems at all three projects, among them: schedules were unrealistic and the wastes were not thoroughly studied.
- DOE notifies Ecology and the Environmental Protection Agency that it is in substantial danger of failing to meet 21 Tri-Party Agreement milestones. Many of the milestones are not due for several years. One of the milestones is not due to be complete until September 2018.
- Hanford workers are taking samples from beneath tank SX-108, following the drilling of a slant well beneath the tank. The tank was assumed to leak in 1962. The samples will help determine risks caused by contaminants in the vadose zone.

“...no samples have ever been taken from a region most impacted by a tank leak... We want to know where the contaminants are now, where they are going, and how fast they are moving.”

— Rick Raymond, Acting Project Manager for the single-shell tank interim closure project. (Hanford Reach, June 26, 2000).

- A range fire burns 192,000 acres on and near the Hanford Site. The fire scorches one crib and two dried up waste ponds, threatens nuclear facilities in the 200 West area, and also threatens the Fast Flux Test Facility and the HAMMER training facility. About 45 percent of the Hanford Site burns, including nearly all of the Arid Lands Ecology Reserve. Initial surveys find no radioactive contamination spread from the fire. About 20 homes are destroyed in Benton City. Seven thousand people are evacuated at one time from Benton City and West Richland. High winds and

June 2000 continued

nearly 100 degree temperatures hamper firefighting efforts. More than 800 firefighters from throughout the Northwest battle the fire.

"If the fire had gone beyond where it did, there was the potential for more serious consequences." — Keith Klein, Hanford Site Manager. (Tri-City Herald, July 3, 2000).

- The Office of River Protection (ORP) issues a notice to terminate its privatization contract with BNFL Inc. At the same time, ORP modifies its contract with CH2M Hill Hanford Group to add vitrification plant design work and operations to its current scope of work. ORP decides against issuing a "bridge" contract to Bechtel to continue the design until the new contract is awarded, after other potential bidders complain that Bechtel would have an unfair advantage in bidding.

Fire scorched much of the Hanford Site. Fire barriers successfully kept the fire from Hanford facilities.



July 2000

- Hanford workers repair 15 plutonium containers at the Plutonium Finishing Plant that show potential to rupture and leak. Plutonium in the containers is either repackaged or baked into a more benign powder.
- An Environmental Protection Agency audit says delays in cleaning up Hanford's underground storage tanks greatly increase environmental risks. The internal audit, by EPA's Regional Inspector General, says cleanup delays significantly increase the risk of leaks from the tanks into groundwater or air. The report criticizes cleanup regulators – the EPA and the Washington Department of Ecology – for failing to enforce cleanup deadlines.
- Hanford makes its first shipment of transuranic waste to the Waste Isolation Pilot Plant in New Mexico. Because of continuing unresolved issues with the State of New Mexico related to properly documenting the origins and contents of the waste, the shipment contains just seven drums of waste. A full load is 42 drums.



A truck hauling transuranic waste from Hanford to New Mexico enters Oregon.

- Monitoring of the Hanford Site shows that the recent range fire did release some radioactive materials into the environment. DOE and the Washington Department of Health say the low levels pose no risk to human health. Citizen groups say the risk may be greater, especially because of the detection of small amounts of plutonium.

July 2000 continued

"I'm very confident there are not going to be health problems. Even if we missed something so far, it'll be below the limits for health risks." — Debra McBaugh, Washington Department of Health. (Tri-City Herald, July 13, 2000).

- DOE's Office of River Protection makes its "Government Fair Cost Estimate" for tank waste treatment publicly available. The government estimate to design, construct and operate tank waste treatment facilities totals \$9.512 billion, as opposed to BNFL's estimate of \$15.2 billion. The "hard-cost" estimates for design, construction and operation of the treatment facilities (along with a contingency), is \$3.653 billion. Private financing was estimated to add another \$5.859 billion. The estimate was to treat about 10 per cent of Hanford's tank waste by 2018.
- DOE releases a draft environmental impact statement related to the restart of the Fast Flux Test Facility. The draft EIS indicates the FFTF could perform the missions under consideration – production of medical isotopes and plutonium-238 for space missions. The draft EIS does not list a preferred alternative.
- Air samples taken in Richland and Pasco after last month's fire at Hanford detected plutonium 100 to 1,000 times higher than normal background, but still well below state and federal safety standards. EPA officials say the readings were similar to those when nuclear weapons tests were routinely conducted in the atmosphere. Monitoring will continue.

- DOE pays BNFL \$100 million as partial payment for its design work on tank waste treatment facilities. DOE will pay BNFL another \$100 million at the end of August. The amount of a third payment, likely to be delivered sometime in 2002, is yet to be negotiated.
- Dick French is removed as Manager of DOE's Office of River Protection over disagreements with DOE Headquarters on issues related to authority over the program.

"I'm very, very disappointed. We found Dick to be an exceptionally open and honest person. We don't know anyone else who is working for this program (very hard) in Washington, D.C." — Dan Silver, Deputy Director, Washington Department of Ecology. (Tri-City Herald, July 29, 2000).

"The Department of Energy has taken a difficult situation and made it much worse with Dick French's removal as chief of the Office of River Protection...top DOE officials' insistence on micro-managing the Hanford Waste Vitrification Project from 3,000 miles away has placed the project... in serious jeopardy. A better tack would be for...the Energy Department's Office of Environmental Management to get out of French's way and stop flouting the will of Congress and the ORP legislation." — Tri-City Herald Editorial. (July 31, 2000)

August 2000

- Harry Boston, DOE Richland's Deputy Manager for Site Transition, is named Acting Manager of DOE's Office of River Protection.
- Environmental monitoring detects small amounts of plutonium in four additional locations, following the late June range fire that swept across large parts of the Hanford Site.

Washington Congressman Doc Hastings (2nd from left) and DOE Office of River Protection Acting Manager Harry Boston (center), at Hanford.



August 2000 continued

- DOE begins shipments of surplus uranium from Hanford to its Portsmouth Site in Ohio. The first shipment includes about 16 metric tons of uranium trioxide powder, a low-enriched uranium powder that resembles small spherical fertilizer pellets. Over the next few months, DOE plans to ship 670 metric tons of surplus uranium trioxide to Portsmouth. DOE also plans to ship approximately 235 metric tons of uranium metal billets to Portsmouth from Hanford.
- A National Academy of Sciences study says more than two thirds of the DOE nuclear weapon production sites – including Hanford – will never be completely cleaned of contamination and will require long-term monitoring.
- DOE and Bechtel begin a soil cleanup project at N Reactor. The cleanup will involve removing nearly 150,000 tons of contaminated soil and debris from cribs and trenches.

"It has only been 13 years since the N Reactor was permanently shut down. This short period of inactivity resulted in radioactivity levels up to 50 times higher than at other soil cleanup sites."

— Rick Donahoe, project lead for Bechtel Hanford. (DOE News Release, August 8, 2000).

- Fluor Federal and CH2M Hill Hanford Group agree to pay \$150,000 in penalties for quality control problems related to pipe welds. The pipes are to be used to transfer highly radioactive waste. The defects were spotted before the pipes were installed.
- About 1,000 persons attend four public

Soil cleanup work near the N Reactor.

meetings in Oregon and Washington concerning whether to restart Hanford's Fast Flux Test Facility. DOE is expected to issue a recommendation in late November.

- DOE removes two Hanford tanks from the Wyden Watch List. Tanks C-102 and C-103 were placed on the Watch List in 1991 because of concerns that a floating layer of organic material similar to kerosene could ignite and release radioactivity into the environment. Subsequent sampling and analysis determined the likelihood for that to occur is extremely unlikely. Twenty five tanks remain on the Watch List.

"We've determined, and DOE agreed, that the possibility of an event and its consequences to the environment are so low, Tanks C-102 and C-103 no longer meet the requirements for the watch list."

— Fran DeLozier, CH2M Hill Hanford Group President. (Office of River Protection News Release, September 6, 2000).

- DOE releases its final request for proposals to design, build and test tank waste treatment facilities. The proposal would delay the scheduled start of construction by about a year – to mid 2002 – but maintain the "hot start" date of 2007.

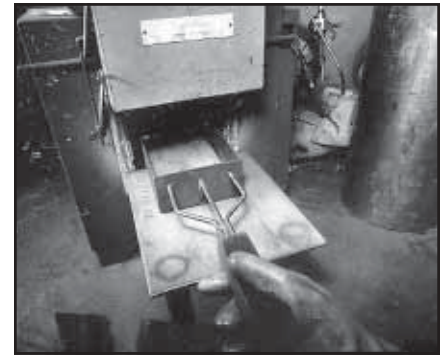


September 2000

- DOE and Ecology agree to a schedule for demonstrating retrieval technology from single shell tanks. DOE will conduct two demonstrations and one full scale retrieval by 2006.
- Major new work at the Plutonium Finishing Plant is underway. Hanford workers begin packaging plutonium-contaminated ash from Rocky Flats. Plans are to eventually ship the ash – which does not need to be stabilized and is currently stored in 411 cans – to the Waste Isolation Pilot Plant for disposal. Workers at the Plutonium Finishing Plant also begin a new process to convert plutonium nitrate acid solutions to a stable form. Solids removed from the liquids will be thermally treated



for final stabilization. And, workers begin putting plutonium metals and powders into long-term storage canisters. The newer canisters are designed to prevent bulging and leaking – a periodic problem with the existing containers.



A "boat" of plutonium-bearing materials is pulled from a furnace in the Plutonium Finishing Plant during the stabilization process.

- DOE, EPA and Ecology sign an agreement for the clean up of contaminated soil, structures and debris from 45 burial grounds in Hanford's 100 Area. The estimated \$400 million cleanup will take about 10 years to complete. Materials excavated from the burial grounds will be disposed in Hanford's Environmental Restoration Disposal Facility.

DOE Richland Manager Keith Klein (kneeling, facing camera) inspects some of the new technology being used in Hanford's Plutonium Finishing Plant.

October 2000

- DOE and Fluor complete the shipment of 667 metric tons of surplus uranium trioxide from Hanford to DOE's facility in Portsmouth, Ohio. The uranium had been stored in the 200 Area and was declared surplus earlier this year.
- Radioactive particles in amounts described as "nuisance levels" drift from a work tent near the C Tank Farm in Hanford's 200 East Area. The work tent was supposed to prevent the spread of any radioactive materials. Contaminated spots are found as far as 300 feet from the work site.
- DOE and Ecology agree to modify a consent agreement to require DOE to award a contract by January 15, 2001 to design and construct

tank waste treatment facilities. Enforcement authority for this agreement will be under a federal district judge rather than through the Tri-Party Agreement.

- EPA reduces the largest fine in Hanford's history. A \$367,078 fine levied in February 1999 against DOE and its contractors was reduced to \$25,000 and about \$90,000 in extra cleanup work. The fine originally related to violations with Hanford's chemical storage practices.
- DOE begins "hot testing" of fuel removal at the K-West basin. Workers are now practicing with their equipment using radioactive spent fuel assemblies, rather than the pieces of pipe

October 2000 continued

they've used during the past few months. Up to 24 fuel canisters, containing 14 fuel assemblies each, will be emptied and the fuel washed and sorted on an underwater table using remotely operated equipment. The intact fuel will be placed in new, stainless steel baskets.

- Two corporate teams submit bids to design and construct Hanford's tank waste treatment facilities. One team is led by Bechtel National and Washington Group International, which has absorbed two major construction corporations in recent years – Morrison Knudsen Corp. and Raytheon Engineers and Constructors. The other includes Fluor Corp., Cogema and Foster Wheeler Corp. DOE has committed to awarding the contract by January 15, 2001.
- DOE determines that the amount of plutonium and other man-made radioactive elements

released into soil or buried in flimsy containers at its sites is 10 times larger than previous estimates. As a result, DOE asks the National Academy of Sciences to review the department's approach to managing the wastes.

- President Clinton signs legislation to provide the first widespread compensation to nuclear workers harmed by exposure to radiation and hazardous chemicals. The bill requires the President to give Congress a proposal by March 15, identifying the types and amounts of compensation and the process to qualify. If Congress does not approve the proposal by July 31, workers or their survivors would be eligible for lump sum payments of \$150,000. They could either accept the payment or go to court in hopes of winning a larger settlement.

November 2000

- A House Commerce Committee report says DOE has wasted much of the \$3.4 billion it has spent on developing new technology to clean up Hanford and other nuclear weapon production sites. The report says hundreds of millions of dollars have been "squandered" on technologies that have not proved useful. The report further states that of the nearly 1,000 new technologies developed, only a few have been put to use.
- The Hanford Advisory Board selects Todd Martin to replace Marilyn Reeves as Chair. The Board's recommendation will go to the Tri-Parties, which make the appointment. Reeves' second three-year term as Chair expires in February and she did not seek re-appointment. Martin is a former researcher for the Hanford Education Action League and is currently an environmental consultant.
- Dan Silver, Ecology's Deputy Director, announces he is leaving December 1 to put together a ballot issue to raise money for small communities and farms to pay for environmental improvements.
- Hanford officials announce that more than a million gallons of Hanford's liquid tank wastes

have been removed from the site's single shell tanks since 1998. Under a federal court-enforced schedule, DOE was given until October 2004 to pump all retrievable liquids from 29 single shell tanks. Six of those tanks have been pumped and 11 more are underway. Seven additional tanks are expected to be started within the next 11 months. About 2.6 million gallons of liquid waste remain to be pumped.

- DOE announces its intent to permanently shut down the Fast Flux Test Facility. DOE was studying whether to restart FFTF, primarily to produce plutonium 238 for space missions and radioisotopes for medical uses. DOE says it will instead use existing facilities. DOE expects to issue a Record of Decision by mid-January.

"Some people around here still want to beat a dead horse. The horse is dead... We've breathed life into it a few times, but I think it's dead, and I don't give up on things easily." — Sam Volpentest, executive vice president of the Tri-Cities Industrial Development Council. (Seattle Post-Intelligencer, November 21, 2000).

- DOE determines it is no longer necessary to operate the mixer pump in tank SY-101. An Unreviewed Safety Question related to growth of the crust inside the tank is also closed. DOE is expected to ask that the tank be removed from a congressional watchlist.
- Hanford workers successfully remove the first spent fuel from Hanford's K-West Basin. The nearly 300 fuel elements are taken to the Cold Vacuum Drying Facility. After about a week of drying, the fuel will then be moved to the Canister Storage Building in the 200 East area, where it will remain indefinitely. Removing spent fuel from the K-Basins has been among Hanford's top cleanup priorities for the past six years. It will take about four years to remove all the spent fuel from both the K-West and K-East Basins, and another two years to remove the remaining sludge, water and debris.
- A consortium of Bechtel National and Washington Group International is awarded a ten year, \$4 billion contract to design, construct and commission facilities to immobilize Hanford's tank waste. Only one other team, which included Fluor, Cogema and Foster Wheeler, had bid on the contract. The contract calls for facilities to be constructed and tested by 2007, with full operations by 2011. Bechtel-Washington expects to employ 700 people and fully take over the design work from CH2M-Hill Hanford Group by April.
- Hanford workers successfully replace a broken, 50-foot transfer pump in Tank AW-104. It was among the most challenging tasks on a Hanford tank in recent years because of the complexity of the work and the levels of contamination involved. The pump installation is part of \$1.4 billion in initial upgrades to prepare Hanford tanks to supply waste to a vitrification plant.

"We have been working toward this day for years. I want to express my sincere appreciation to the Department of Energy and the contractors for working so hard to make this day a reality." — Washington Governor Gary Locke. (DOE News Release, December 7, 2000).

"Success on this job is more evidence of our readiness for the activities needed to get on with waste retrieval and treatment. Removal and replacement of large failed equipment will be part of the routine

"This may be the most significant accomplishment we've seen in 11 years of Hanford cleanup." — John Savage, Director of the Oregon Office of Energy. (DOE News Release, December 7, 2000).

A canister of spent nuclear fuel is taken into the Canister Storage Building.



December 2000 continued

activities needed to retrieve and treat tank waste.” — Harry Boston, Office of River Protection Acting Manager. (ORP News Release, December 14, 2000).

- Fluor Hanford’s contract to manage a major part of Hanford cleanup is extended for six years and \$3.8 billion. The contract includes incentives for Fluor to earn up to \$168 million in profits. Fluor has been the primary contrac-

tor at Hanford since October 1996. Its current contract was due to expire in 2001.

- DOE agrees not to ship low-level waste to Hanford from other than its traditional shipping sources until at least fall. DOE Headquarters agrees to wait on new shipments until after Hanford’s Solid Waste Environmental Impact Statement is issued.

January 2001

- President-elect George Bush nominates Spencer Abraham, recently defeated for re-election to the Senate from Michigan, as Secretary of Energy.
- Harry Boston is named Manager (instead of Acting Manager) of the Office of River Protection.
- Local governments in the Tri-Cities are exploring legal action against DOE to force a reversal of its decision to shut down the Fast Flux Test Facility.
- Energy Secretary Bill Richardson announces proposed amendments to a compensation program for workers who suffered medical problems as a result of exposure to radioactive materials or chemicals at Hanford and other DOE sites. The current law provides a lump sum payment of \$150,000. The proposed amendment would allow compensation for lost wages or \$150,000, whichever is greater. Other proposed amendments would streamline the compensation program.
- DOE extends CH2M Hill Hanford Group's (CHG) contract at Hanford. CHG manages Hanford's tank farms and is responsible for ensuring waste is ready for retrieval from the tanks once vitrification facilities are operational. The five year contract extension is worth \$2.2 billion.
- Before leaving office, Energy Secretary Richardson signs a Record of Decision, ordering the permanent closure of FFTF.
- The U.S. Senate confirms Spencer Abraham as Secretary of Energy.

February 2001

- A second container of spent fuel is taken from K-West basin to the Cold Vacuum Drying facility.
- Tank SY-101 is removed from the Wyden watch list. Once the top safety problem in the DOE complex because of periodic releases of hydrogen gas, the tank is expected to be available to take waste from other tanks later this year. More than half a million gallons of waste was pumped out of the tank in 1999 and 2000, and water was added to dilute the remaining waste. This dissolved nearly all the gas-retaining solids in the tank. Twenty four tanks remain on the watch list.

"I'm glad to see a creative solution to this serious and long-standing problem, and glad to cross this extremely dangerous tank off the watch list. Now, we need to finish the job – and make sure all the tanks threatening the Columbia River

A streak of rust is visible inside tank AY-101.

and our citizens downstream are made permanently secure"

— Oregon Senator Ron Wyden. (DOE News Release, February 8, 2001).

- An unusually high amount of rust is found inside one of Hanford's 28 double shell tanks. Further tests are needed to determine whether the rust has led to the half-inch steel walls



February 2001 continued

getting thinner or weaker. Video taken by tiny robot vehicles inside tank AY-101 in the 200 East Area show significant patches of rust. Seven other tanks had only small amounts of rust. No additional waste will be added to the tank until more is understood about the cause and potential effects from the rust.

- DOE begins the shipment of 258 tons of uranium billets from the 300 Area to a DOE facility in Portsmouth, Ohio. Billets are heavy 20-inch-long cylinders that hold uranium. Smaller amounts of uranium pellets will also be shipped to Portsmouth, and some uranium will be shipped to Sandia National Laboratory for research. Additional uranium – up to 150 tons, will be buried in Hanford's disposal trenches between now and June. The uranium was originally intended for use in Hanford's plutonium production reactors. It has been stored at Hanford since the reactors were closed.
- Washington's Pollution Control Board says the Department of Ecology can enforce Tri-Party

Agreement milestones as soon as they appear to be in jeopardy – rather than having to wait until a milestone is actually missed. DOE and Ecology have strongly disagreed in recent years over when Ecology can take enforcement action. After unsuccessful negotiations on new milestones for tank waste treatment, Ecology Director Tom Fitzsimmons imposed milestones and the enforcement issue in March 2000, as the TPA allows. DOE appealed, and the issue was heard by the Pollution Control Hearings Board. DOE can appeal the ruling in federal court.

"This is very good news for the state of Washington...The state's environment should not continue to be at risk because of the Department of Energy's failure to meet its commitments under the Tri-Party Agreement." — Washington Attorney General Christine Gregoire. (Seattle Post Intelligencer/Associated Press, February 16, 2001).

March 2001

- A 6.8 earthquake strikes the Puget Sound area. The earthquake triggers an apparent false reading about the level of waste in one of Hanford's underground storage tanks. A measuring device registers a two inch drop in tank B-111 – a previously suspected leaker. After re-calibrating the measuring device, the tank waste level returns to normal.
- Load restrictions are placed above a Hanford tank while a possible crack is investigated in the reinforced concrete dome of tank C-107, a single shell tank. A video camera showed an anomaly during a routine sampling. Additional tests will be conducted to determine whether there is any structural problem.
- Washington Governor Gary Locke and Attorney General Christine Gregoire write to President Bush and Energy Secretary Abraham, asking for sufficient funding to meet cleanup milestones at Hanford. In a related news release and letter to Washington Congressman

Doc Hastings, Gregoire threatens legal action if the Bush Administration cuts cleanup funding to Hanford.

"We respectfully request that you demonstrate your unequivocal support for cleaning up Hanford within the agreed to timelines by requesting and advocating the appropriate level of funding that is needed." — Letter to President Bush from Governor Locke and Attorney General Gregoire, March 14, 2001.

"In my conversation with the Secretary of Energy, I explained that I want all of our resources dedicated to cleaning up the site, not battling it out in court. However, if the Department of Energy is not meeting its legally binding commitments, the State of Washington will have no choice

March 2001 continued

but to commence a legal action to ensure that the cleanup moves forward.”

— Letter from Attorney General Christine Gregoire to Congressman Doc Hastings, March 19, 2001.

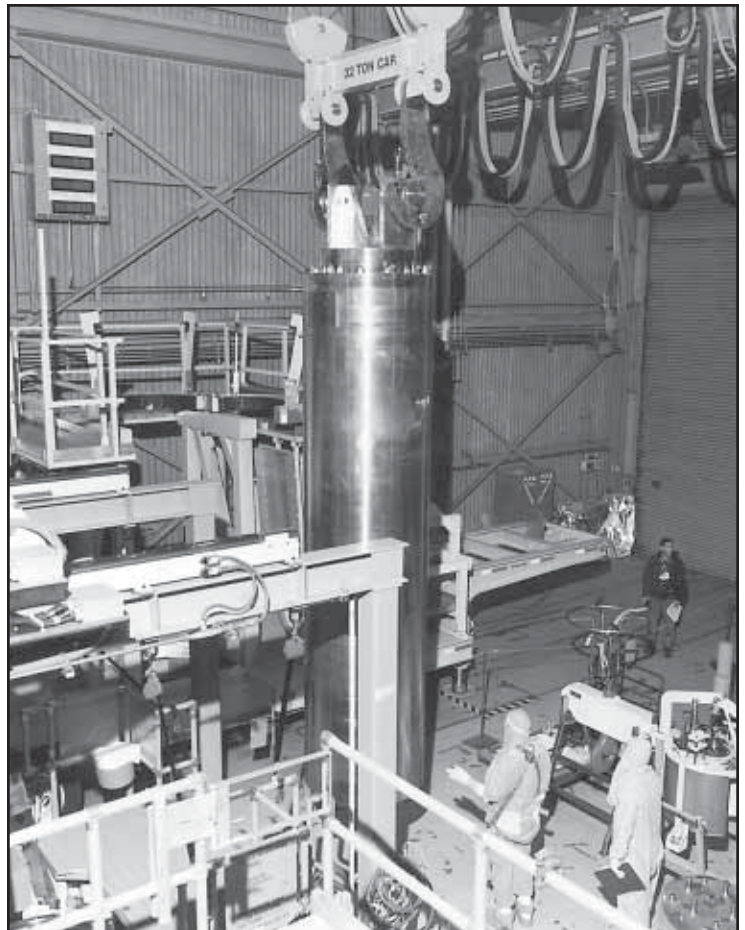
- Ecology levies a \$57,800 fine against DOE and Fluor Hanford for failing to properly identify and manage a reactive chemical waste stored at a Hanford laboratory. A container of the chemical Collodion was detonated by the Richland bomb squad after it was discovered at

a Hanford laboratory in January. A subsequent search found additional quantities of the chemical which were not properly labeled. Hanford had numerous problems with identifying and properly storing chemicals in the late 1990s.

“We’ve been here before, and we’re disappointed to keep seeing the same problems.” — Bob Wilson, Ecology inspector. (Department of Ecology News Release, March 26, 2001).

April 2001

- Washington Congressman Doc Hastings asks Energy Secretary Abraham for a one year suspension of the Clinton Administration’s decision to permanently shut down the Fast Flux Test Facility. That moratorium would allow for a new review of the reactor’s potential uses.
- Corroding spent nuclear fuel in Hanford’s K-East basin will first be moved to the neighboring K-West basin, before it is packaged and sent to the central part of the site for long-term storage. Fluor Hanford officials hope this process — rather than installing elaborate fuel-loading and sorting equipment in the K-East basin — will help them meet schedules for removing fuel from both basins. Since late last year, Fluor workers have been sorting and repackaging spent fuel in the K-West basin, and are struggling to meet a schedule to have all fuel removed from the basin by the end of 2002. Once completed with the K-West basin, they would then have 19 months to remove all the fuel from the K-East basin. Now, Fluor will add a second shift within a few weeks, and a third shift in early 2002 to increase progress at K-West basin. Once it is about empty, they will begin to move fuel from the K-East basin to the K-West basin for sorting and packaging.
- In what is intended as a last minute warning before DOE releases its 2002 cleanup budget, Ecology and EPA call on DOE to provide adequate funding to meet its Hanford cleanup obligations. Early indications are that the Bush Administration will not provide sufficient funding to Hanford for DOE to meet cleanup schedules.



A canister containing spent nuclear fuel is moved in one of the K-Basins.

April 2001 continued

"Compliance with the (Tri-Party Agreement's) requirements is not optional." — Letter from Charles Findley, EPA and Washington Ecology Director Tom Fitzsimmons to DOE. (Tri-City Herald, April 4, 2001).

- A line on the inner concrete dome of a Hanford waste storage tank is determined to be a shadow, not a crack. In March, a video inspection of Tank C-107 found the suspicious line.
- The Bush Administration's proposed Fiscal Year 2002 budget is about \$400 million less than Hanford officials had requested. Funding for DOE's Office of River Protection is slated to increase slightly – but not nearly as much as had been requested. The budget for DOE's Richland Operations Office would be cut by more than \$100 million – when Richland managers were hoping for a slight increase from FY 2001 funding levels. Washington State officials say if the funding levels remain as proposed, they will have no choice but to go to court.

"This budget sets a sensible course by clearly fulfilling commitments and establishing key priorities, but at the same time signals our intention to rethink a host of programs while we craft the Bush Administration's policy." — Energy Secretary Spencer Abraham. (DOE News Release, April 9, 2001).

"If approved, this budget could leave the state with no choice but to engage in lengthy and expensive litigation over DOE's missed cleanup deadlines. I am troubled that the administration does not seem to understand its obligations to meet its contract commitments." — Washington Attorney General Christine Gregoire. (Washington Attorney General News Release, April 9, 2001).

- Energy Secretary Spencer Abraham suspends the shutdown order for the Fast Flux Test Facility for 90 days, while DOE explores potential partnerships to cover the costs of operating the reactor.

May 2001

- One of Hanford's double shell tanks may have two small pinholes in its inner steel wall. Tear-drop shaped stains inside tank AY-101 could have been caused by rainwater leaking in to the space between the two steel layers of the tank and corroding through the inner layer. No waste has been detected in the space between the two layers and no waste has leaked from the tank to the environment. The 1.16-million-gallon tank now



holds 165,000 gallons of wastes. The pinholes – if they exist – are about 20 feet above the level of the waste. Until the issue is resolved, no more wastes will be added to the tank.

"This could be the first wall failure in a double-shell tank, and those tanks aren't getting any younger...we can't rely on the double-shell tanks forever." — Mike Wilson, Washington Department of Ecology. (Tri-City Herald, May 3, 2001).

- DOE, EPA and Ecology sign the final Record of Decision (ROD) for the 300 Area at Hanford. The ROD outlines how DOE and its contractors will remove contaminated soil, structures, and associated debris from 47 waste sites and nine burial grounds – including the 618-10 and 618-11 burial grounds north of the 300 Area.

Hanford's 300 Area.

May 2001 continued

- Ecology Director Tom Fitzsimmons, in a letter to Energy Secretary Abraham, says further delays in meeting cleanup milestones are not acceptable. Fitzsimmons says the state has already granted many extensions to cleanup deadlines.
- Energy Secretary Abraham tells a Senate Committee that DOE does not need additional funding for fiscal year 2002. Despite questioning from two northwest senators – Maria Cantwell from Washington and Larry Craig from Idaho, Abraham refuses to endorse additional funding for Hanford or any other DOE site.

“We’ve presented the budget that we think is appropriate for the department... In my judgment, a billion more dollars isn’t going to do much more because ... most of the (DOE cleanup) sites don’t have a short-term game plan. They’ve got some milestones in some places but not ones that are going to bring about cleanup in a short time frame.” — Energy Secretary Spencer Abraham. (Tri-City Herald, May 11, 2001.)

- The manager of DOE’s Brookhaven, New York laboratory will head a review of Hanford’s Fast Flux Test Facility. Mike Holland will direct the new assessment of possible uses of the reactor and whether there is interest in the private sector in partly funding operation of the reactor.
- Ecology manager Mike Wilson, in a letter to Hanford managers Keith Klein and Harry Boston, says Hanford’s proposed fiscal year 2002 budget is unacceptable. Wilson says Ecology cannot accept delays in the single-shell tank retrieval program or delays in the construction and hot commissioning of tank waste treatment facilities. The letter also raises concerns about cutbacks in tank farm upgrades, vadose zone characterization and groundwater monitoring programs, and cleanup work along the Columbia River.

“Ecology will not accept the wholesale dismantlement of projects that in many cases have been established through years

of thoughtful and responsible development.” — Letter from Mike Wilson to Keith Klein and Harry Boston, May 14, 2001.

- Washington Group International – a subcontractor for Hanford’s tank waste treatment facilities – files for Chapter 11 bankruptcy. Washington Group is the primary subcontractor for Bechtel National, which is responsible for the design, construction, and initial operation of Hanford’s tank waste vitrification facilities. DOE and Bechtel officials say the financial problems faced by the Washington Group should not impact the Hanford project.
- Energy Assistant Secretary Carolyn Huntoon tells a Senate Appropriations subcommittee that the Bush Administration’s proposed budget will likely require changes in the Hanford cleanup schedule. Huntoon says she hopes the funding is sufficient to begin construction of tank waste vitrification facilities.
- Ecology officials reject DOE’s request to delay some Tri-Party Agreement milestones related to the construction and operation of vitrification facilities.

“DOE’s proposals are evidently based on the incorrect assumption that changes made unilaterally by DOE to contract terms and baselines justify modifying the (Tri-Party Agreement). DOE is required to manage its contract terms and baselines to ensure compliance with the schedule contained in the (Tri-Party Agreement), not vice versa.” — Letter from Mike Wilson of Ecology to James Rasmussen of ORP. May 16, 2001.

- President Bush’s nominee to head DOE’s environmental cleanup program tells a Senate committee that hard decisions must be made and she’s not satisfied with “70 year schedules and mind-boggling budgets.” Jessie Roberson formerly managed the Rocky Flats Site in Colorado.

“The challenge of this program is great, but it does not mean taking three

May 2001 continued

generations to see results. I do not want to leave this for my daughter's children to figure out. We can and we must do better.” — Jessie Roberson, Nominee for Energy Assistant Secretary for Environmental Management. (Tri-City Herald, May 17, 2001).

- A DOE Inspector General Report says DOE is not making good use of its available low-level waste disposal facilities at Hanford and the Nevada Test Site. The audit shows that during the past two years, the Nevada and Hanford disposal facilities operated at less than 50 percent of capacity, yet DOE continued to store large amounts of waste at generator sites and disposed of some low-level waste at commercial facilities.

- Oregon Governor John Kitzhaber writes to President Bush, expressing deep concern about the proposed Hanford budget.

“Setting the budget for Hanford without considering the goals and required actions for cleanup is shortsighted. It will make future cleanup measures more complicated and more expensive. Ultimately, there will be no budget gain from sacrificing progress on the cleanup at Hanford.” — Letter from Oregon Governor John Kitzhaber to President Bush, May 28, 2001.

June 2001

- The Attorneys General of 10 states, in a letter to Energy Secretary Abraham, say they oppose renegotiating cleanup deadlines simply to accommodate the Bush Administration's spending priorities. The letter encourages DOE to maintain adequate funding to meet its environmental obligations.

“We are skeptical that management reforms, innovative technologies, and streamlined regulation are a panacea that will make up for substantial budget cuts

and keep DOE's cleanup program on track...Requesting extensions to milestones in cleanup agreements to accommodate spending priorities does not constitute management reform, and we oppose such requests.”

— Letter from 10 Attorneys General – including Christine Gregoire of Washington and Hardy Myers of Oregon – to Secretary Abraham, June 12, 2001.

July 2001

- Jessie Roberson is sworn in as DOE's Assistant Secretary of Environmental Management.
- Improperly calibrated equipment apparently results in some transuranic waste being buried in Hanford's Environmental Restoration Disposal Facility. Transuranic waste is supposed to be disposed in the Waste Isolation Pilot Plant – a deep geologic repository in New Mexico. The problem went unnoticed for two years. The mistake is not expected to pose any threat to human health or the environment, although regulators could potentially order the wastes

retrieved from ERDF. At least 232 pieces of contaminated equipment may have been improperly analyzed, of which 108 have been buried in ERDF in 14 boxes.

“How we can go for two years and not detect this analytical problem? The analytical work is sloppy at best.” — Doug Sherwood, EPA. (Tri-City Herald, July 25, 2001).

July 2001 continued

- Ecology announces its intent to levy a weekly fine against DOE if it misses a July 31 deadline to begin construction on tank waste treatment facilities. DOE's request to eliminate the deadline was denied by Ecology. Fines will be assessed beginning August 1 and will continue until construction begins or until DOE submits an acceptable plan demonstrating how the treatment facilities will be operational beginning in 2007. Under the Tri-Party Agreement, the state can fine DOE up to \$5,000 for the first week after a missed deadline, and up to \$10,000 for each subsequent week until the problem is fixed. If the start of construction begins a year late, the potential fine could be \$515,000.

"For us, security means a sufficient budget, spending authority from the President, and a work plan that we know is achievable. Our focus is on action and results, and that's the message we are sending with the fines."

*— Tom Fitzsimmons, Ecology Director.
(Ecology News Release, July 26, 2001.)*

"The state has always been willing to bark (about enforcing Hanford's cleanup deadlines), and now it has reached the end of its rope, and is willing to bite... This certainly signals that the intentions of the Tri-Party Agreement are alive and well." — Todd Martin, Chair of the Hanford Advisory Board. (Tri-City Herald, July 27, 2001).

- The Energy Employees Occupational Illness Compensation Program Act takes effect, providing money to nuclear workers who may have gotten cancer or other diseases as a result of on-the-job exposure to radiation or hazardous chemicals. An office opens in Kennewick to handle claims by Hanford workers, retired workers and their survivors.

August 2001

- DOE announces a 60 day review period to assess a commercial proposal to operate the Fast Flux Test Facility for the production of medical isotopes. Advanced Nuclear & Medical Systems of Richland proposes to lease the reactor for 35 years and use fuel from Europe. Organized labor would provide the financing. DOE would be asked to pay for stand-by costs for the next three years.
- DOE and Fluor complete removal of contaminated debris and equipment from B-Cell, which contained nearly three million curies of radioactivity. Because of the high radiation levels in the area, remote-control devices were used in the cleanup. B Cell is located in Hanford's 300 area.
- A National Academy of Sciences Committee concludes that the "knowledge and technology to address the most difficult problems (at Hanford) do not yet exist." The Committee has some praise for work underway or completed at Hanford, including the science and technology

work of the Groundwater/Vadose Zone Integration Project. The Committee's report says cleanup timelines are driven by government regulations rather than by scientific needs. The Committee was also sharply critical of the lack of funding dedicated to science and technology development.

"The Hanford cleanup program appears to operate on the philosophy that it is better to take a step in approximately the right direction than to know exactly where it is going." — National Academy of Sciences Report. (The Oregonian, August 3, 2001).

- DOE removes the final 24 tanks from the Wyden Watch list, which required extra monitoring due to various safety issues. Oregon Senator Ron Wyden introduced legislation in 1990 which created the watch list in early 1991. Sixty of Hanford's 177 underground tanks were on the list at one time or another — many for

August 2001 continued

more than one safety-related issue. The removal of all tanks from the watch list beats a Tri-Party Agreement milestone which required that to happen by September 30.

"A decade ago, I responded to the dangerous threat posed by certain nuclear waste storage tanks at Hanford by passing a law to protect the people of the Northwest from possible radioactive tank explosions. Today, I'm proud to see the watch list become extinct." — Oregon Senator Ron Wyden (DOE-ORP News Release, August 17, 2001).

"Our employees have worked hard to improve the conditions in these tanks, not only to remove them from the watch list, but also to make them available for



A Hanford tank farm.

normal operations." — Fran DeLozier, President and General Manager of CH2M HILL Hanford Group (DOE-ORP News Release, August 17, 2001).

- The Office of River Protection formally appeals Ecology's July 26, "Final Determination" which imposes fines on DOE for missing a start of construction deadline for the tank waste treatment facilities.

September 2001

- DOE is preparing its "recovery plan" to explain how it will begin operation of waste treatment facilities by 2007, even though the start of construction has been delayed by more than a year. Ecology Director Tom Fitzsimmons says that unless Congress and the Administration provide sufficient funding to move forward with construction, any recovery plan is meaningless. And, if it appears DOE will not make the 2007 deadline, the state is prepared to sue.

*"Our lawyers are sharpening every sword and every arrow in their quivers."
— Ecology Director Tom Fitzsimmons.
(Tri-City Herald, September 7, 2001).*

- DOE Headquarters orders a reduction in the number of DOE employees. That will result in the loss of about 10 percent of federal employees at both DOE's Richland Field Office and Office of River Protection. The Richland

office's target is 339 positions. It currently has 366 federal employees. The Office of River Protection is supposed to cut from 130 employees to 109. The Office of River Protection had been in the process of expanding its federal workforce to 150, to help manage the tank waste vitrification program.

- Security at Hanford is increased following the terrorist attacks on the World Trade Center and Pentagon.



Vehicles waiting to enter the Hanford Site.

- Tank SY-101 is returned to service and available to receive waste for the first time in two decades.

October 2001

- A watchdog group says DOE sites are vulnerable to terrorist attacks. The Project on Government Oversight says mock terrorist attacks on DOE facilities over the past several years have succeeded more than half the time. The eight month study is based on unclassified documents and information from more than a dozen whistleblowers. Although DOE officials say security at all DOE sites has been tightened since the September 11 terrorist attacks, a spokesman for the Project says the sites are still vulnerable. According to the report, mock terrorists, including Navy SEAL commandos, were successful in stealing plutonium and other nuclear materials from Rocky Flats in Colorado and at Los Alamos in New Mexico. The study made no specific reference to Hanford. The



A reactor compartment from a nuclear-powered cruiser on the Columbia River.

study recommended consolidating all nuclear materials at a few sites and creating an independent agency outside of DOE to handle security.

- The 100th naval nuclear reactor compartment is sent from Puget Sound Naval Shipyard to Hanford for disposal.



Submarine and cruiser reactor compartments in a trench at Hanford.

November 2001

- Office of River Protection Manager Harry Boston says DOE is exploring alternatives to vitrifying all of Hanford's tank waste in hopes of saving tens of billions of dollars and completing the cleanup decades ahead of schedule. Boston says the initial vitrification plant will likely be able to treat much more waste than was originally envisioned, possibly eliminating the need for an additional, larger plant to complete the work. Boston says increasing ORP's annual budget from about \$1 billion to the \$3 to \$4 billion needed to construct and operate a second vitrification facility is simply not doable. Boston says many of Hanford's tanks hold very little liquid waste and perhaps could be left in place.

"The technology you use should be tailored to the problem. (If there are ways to more cheaply handle the waste while protecting the environment and people), shouldn't we talk about it?" — ORP Manager Harry Boston, at a meeting of the Hanford Advisory Board (Seattle Post-Intelligencer, November 7, 2001).

Energy Secretary Spencer Abraham at Pacific Northwest National Laboratory.

"We would really like to see what the technology can do, before we say what it can't do." — Suzanne Dahl, Washington Department of Ecology. (Seattle Post-Intelligencer, November 7, 2001).

- Secretary Abraham makes his first visit to Hanford. During a brief, few hours in the Tri-Cities, he meets with federal employees, tours the Fast Flux Test Facility, announces an extension of Battelle's contract to manage Pacific Northwest National Laboratory, and briefly visits a tank farm.



November 2001 continued

- President Bush signs the Energy and Water Appropriations bill, giving Hanford about \$1.82 billion for fiscal year 2002.

"This year's budget process did not begin well when the administration's budget recommendations included reductions in nuclear waste cleanup funding. This

proposal was unacceptable and was rejected by Congress. Congress' support for full cleanup funding has prevailed, and the federal government's legal, contractual and moral cleanup obligations will be met at Hanford." — Rep. Doc Hastings of Washington. (Tri-City Herald, November 14, 2001)

December 2001

- DOE is looking to cut \$100 billion and 30 years from its current cleanup estimates. That would in part be accomplished by not vitrifying 75 percent of DOE's high-level liquid waste, including much of the waste stored in Hanford's aging underground tanks. A November 19 memo from Energy Assistant Secretary Jesse Roberson to DOE's budget office outlines nine priorities to reduce the time and cut the cost of cleanup. The memo suggests DOE needs to develop at least two proven cost-effective solutions to vitrification.

*"That memo is one of the most troubling things we've seen in a long time."
— Mike Wilson, Manager, Washington Department of Ecology Nuclear Waste Program. (Tri-City Herald, December 7, 2001).*

- Congress approves extending the Office of River Protection as a separate entity to 2010.
- Energy Secretary Abraham orders the permanent shut-down of the Fast Flux Test Facility. A DOE review of a proposal to restart the reactor for medical isotope production says the proposal fails to specifically identify markets and fails to demonstrate adequate financing.
- A General Accounting Office report recommends DOE look at restructuring itself and shift some missions to other agencies or farm out more responsibilities to private companies. The report says DOE has trouble handling its unrelated missions and that its managerial shortcomings result in cost overruns and delays.

January 2002

- Washington Senator Maria Cantwell and Oregon Senator Ron Wyden write to President Bush, asking that Hanford cleanup be fully funded in fiscal year 2003. Oregon Senator Gordon Smith sends similar letters to the Office of Management and Budget and Energy Secretary Abraham.

"It is our sincere hope that, unlike last year, the administration's budget for (fiscal year) 2003 will be sufficient to meet the federal government's commitment to clean up our nation's nuclear waste sites in a fashion that is consistent with existing state and federal laws." — Letter from Senators Cantwell and Wyden to President Bush, January 7, 2002.

- Energy Secretary Abraham notifies the Governor of Nevada that he intends to recommend to President Bush the selection of Yucca Mountain as site of a permanent geologic repository for high-level nuclear waste.
- DOE announces its plans to move forward with the disposal of 34 metric tons of surplus weapons grade plutonium by turning it into mixed

oxide (MOX) fuel for use in nuclear reactors. Previously, DOE endorsed a dual-track approach to dispose of the plutonium including turning some of the material into MOX reactor fuel and immobilizing the remaining plutonium in radioactive glass logs for long-term storage. Eliminating immobilization saves nearly \$2 billion. In September 2000, the United States and Russia signed an agreement committing each country to dispose of 34 metric tons of surplus plutonium. The MOX conversion process is expected to cost \$3.8 billion over 20 years, including the construction of two new conversion facilities at DOE's Savannah River Site in South Carolina.

"There is an increased urgency to move forward with the elimination of surplus weapons grade material like plutonium. Focusing on proven technologies to eliminate this material, reducing costs in the process, and keeping our commitment to national security and the clean-up of former weapons sites is the right path to follow." — Energy Secretary Spencer Abraham (DOE News Release, January 23, 2002).

February 2002

- Bechtel awards contracts to move hundreds of barrels containing uranium and oil to Hanford's central plateau. An estimated 1,500 barrels of uranium chips are in the 618-4 burial ground, just north of the 300 area and only a few miles from Richland. The barrels were discovered during excavation work in 1998. The Hanford fire in 2000 came within a few hundred feet of the burial site, threatening 300 of the barrels which had been uncovered in 1998. The barrels will be stored on concrete pads in Hanford's 200 area, until permanent disposal is determined. The barrels are expected to be moved by July 2003.



Workers at the 618-4 burial ground.

February 2002 continued

- President Bush's proposed Fiscal Year 2003 budget sets Hanford's budget at \$1.46 billion – about \$260 million less than the FY 2002 budget. However, Hanford, along with other sites, can apply for additional funds from an \$800 million account set-aside for expedited cleanup activities.

"Without more details, I don't know if this is scary or a good opportunity. Initially, it looks daunting...leaning toward scary."

— Todd Martin, Hanford Advisory Board Chair (*Tri-City Herald*, February 5, 2002).

"We're not taking money away. But we're reinvesting money to do more work."

— DOE Assistant Secretary Jessie Roberson. (*Tri-City Herald*, February 5, 2002).

- DOE Headquarters releases a Top-to-Bottom review of its Environmental Management program. The report identifies a number of weaknesses in the program and recommends: improving DOE's contract management; moving the cleanup program to an accelerated, risk-based cleanup strategy; and aligning DOE's internal processes and its scope to support these changes.
- DOE issues a directive to no longer maintain the Fast Flux Test Facility in a condition for a possible restart.
- DOE Richland Manager Keith Klein and Office of River Protection Manager Harry Boston say Hanford is well positioned to compete for funds from the \$800 million dollar expedited cleanup account. They suggest a number of Hanford projects could be accelerated, including work at the Plutonium Finishing Plant, moving spent fuel from the K-Basins, and studying whether some waste tanks might be closed sooner than the current plans.

"These (accelerated plans) are things we've already been doing. We just have to tie it up, wrap it in a ribbon and present it to the powers-that-be back there (in Washington, D.C.)." — Richland Manager Keith Klein (*Tri-City Herald*, February 9, 2002).

- DOE announces that 40 percent of the 70 Senior Executives in the Environmental Management program are being reassigned. A total of 27 senior staff are involved, including ORP Manager Harry Boston and RL Deputy Manager Bob Roselli. Both are assigned to Headquarters. Roy Schepens, currently at the Savannah River Site in South Carolina, will replace Dr. Boston as the Office of River Protection Manager. Reassignments include moves from headquarters to the field, field to headquarters, moves between field offices, and positional moves in headquarters.

"The purpose of these reassignments is to better leverage the unique talents of these executives, force better integration between the field and headquarters...and to stimulate new thinking and creative solutions to our cleanup challenges.

Executive reassignments will continue in order to better develop the program's leadership cadre and to keep a fresh and dynamic perspective about solving the EM challenges." — DOE Assistant Secretary Jessie Roberson (DOE News Release, February 13, 2002).

- Energy Secretary Abraham formally recommends to President Bush that the Yucca Mountain site in Nevada be developed as the nation's first long-term geologic repository for high-level radioactive waste.

"I have considered whether sound science supports the determination that the Yucca Mountain site is scientifically and technically suitable for the development of a repository. I am convinced that it does."

— Letter from Energy Secretary Spencer Abraham to President Bush (DOE News Release, February 14, 2002).

- President Bush notifies Congress that he considers Yucca Mountain qualified for a construction permit application, taking the next in a series of steps required for approving the site as a nuclear waste repository.

February 2002 continued

- Washington Governor Gary Locke meets with Energy Secretary Abraham, telling him he expects DOE to meet its cleanup obligations at Hanford. Locke tells Abraham he endorses the idea of accelerating cleanup by providing incentives to contractors, but that should not come at the expense of providing full funding for cleanup.

πWe will do everything necessary to protect Washington state's interests. We sued the Clinton administration. We will

sue the Bush administration. It's not partisan. We've seen too many delays."
— Washington Governor Gary Locke. (*Tri-City Herald*, February 27, 2002).

- The U.S. Health and Human Services Department says at least 15,000 cancer deaths in the United States were probably caused by radioactive fallout from Cold War nuclear weapons tests. The new study also suggests 20,000 non-fatal cancers among U.S. residents could also be linked to fallout from above-ground tests.

March 2002

- DOE concludes a tritium plume less than four miles from the Columbia River will not reach the river in concentrations large enough to pose any harm. The tritium comes from the 618-11 burial ground, which is adjacent to Energy Northwest's commercial nuclear power plant, located at the southern part of the Hanford Site. DOE concludes it will take 70 to 80 years for the plume to reach the river.

- Two environmental organizations and the Yakama Indian Nation file a federal lawsuit against DOE in an effort to prevent them from leaving radioactive waste in underground storage tanks at Hanford and two other DOE sites. DOE has begun exploring whether they can close some of the tanks without removing all the waste.

- DOE, the State of Washington and EPA sign a Letter of Intent to accelerate cleanup at Hanford. The intent is to complete cleanup by 2025 or 2035, instead of DOE's current estimate of 2070. As a result of the agreement, DOE agrees to seek an additional \$433 million in funding for Hanford for FY 2003. That money will come from DOE's proposed \$800 million expedited cleanup account. DOE also pledges to fund the accelerated cleanup at Hanford through at least 2006. State and federal officials have been working on acceleration plans for more than a year, putting Hanford in position to become the first DOE site to receive a commitment to get any of these funds. Specific cleanup projects will be identified in the coming months

"(DOE) and the Office of Management and Budget are promising that the days of fighting over nuclear cleanup budgets are behind us. I sincerely hope they are."
— U.S. Sen. Patty Murray, D-Washington. (*Tri-City Herald*, March 7, 2002).

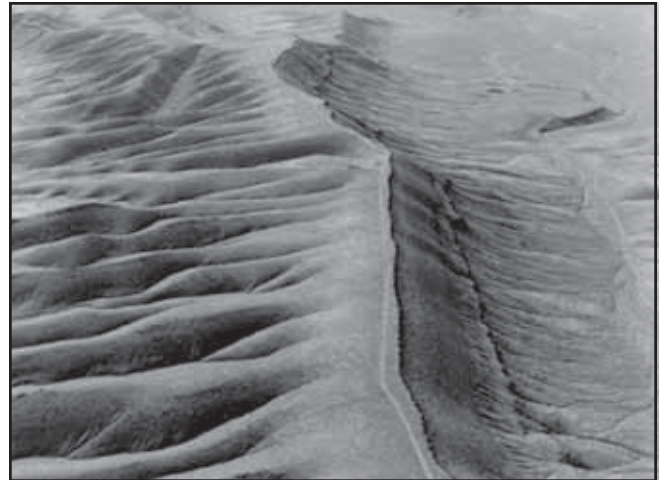
"Whether any of it will pan out ...I'm dubious. We've been around this block three or four times. When political and budget pressure increases, heretofore unheard of, magical technologies appear. There's always something on the horizon that's going to make this job easier."
— Todd Martin, Hanford Advisory Board Chair (*Seattle Times*, March 10, 2002).

- Ecology agrees to stop assessing a \$10,000 per week fine against DOE, after signing off on DOE's recovery plan to keep the vitrification project on schedule. The fine was levied after DOE missed a 2001 milestone to begin construction of the vitrification facilities. The fines total \$305,000. The state will forgive the fine if the project receives full funding for the upcoming federal fiscal year and if construction begins this year.
- DOE issues a request for proposal for a contract to complete most of the cleanup along Hanford's Columbia River shoreline. Bechtel Hanford is currently doing the work and intends to bid on the contract.

April 2002

- Nevada Governor Kenny Guinn vetoes President Bush's selection of Yucca Mountain as the nation's high-level nuclear waste repository. The veto now goes to Congress, which needs a simple majority vote in both houses within 90 days to override the veto.

*"Nevada's state slogan is 'Battle Born.' We came into this union fighting for our preservation, and we will continue to show the country we are united in our fight against Yucca Mountain."
— Nevada Governor Kenny Guinn.
(Las Vegas Sun, April 8, 2002.)*



Aerial view of the north end of the Yucca Mountain crest.

May 2002

- DOE releases a draft cleanup plan to accelerate Hanford cleanup. The goal is to complete cleanup no later than 2035, and perhaps as early as 2025, rather than 2070 as is currently DOE's Hanford baseline. The plan includes earlier operation of the vitrification facilities; using some alternative technology for much of the lower activity waste from the tanks; beginning to close tanks within the next few years; and accelerating removal of spent fuel from the K-Basins. Regulators and stakeholders will provide input to finalize the plan by August 1.

"We have seen so many different Hanford cleanup plans proposed over the years. Most of them never held up to even the

*most basic scrutiny, they simply delayed cleanup. The fact this plan was developed in close consultation with the regulators and has the support of DOE Headquarters is encouraging." — Michael Grainey, Director, Oregon Office of Energy.
(Oregon Office of Energy News Release, May 3, 2002).*

- Allied Technology Group's (ATG) Richland facility resumes limited operation, while the company remains in bankruptcy. The company treats chemical and low-level radioactive wastes to reduce the volume and convert it into a safer form. DOE is counting on ATG treating large volumes of Hanford's waste.



Hanford's Cold Test Facility.

- Construction of the Cold Test Facility – a mock-up of a Hanford tank – is complete. The large open-top tank is the same width as one of Hanford's million gallon tanks. The facility will be used to demonstrate tank cleanup equipment and

May 2002 continued

train workers on waste retrieval and other techniques. The mock tank, located near the HAMMER training facility, will hold about 600,000 gallons of fake sludge and waste.

- DOE auditors say the K-Basin project is behind schedule and Tri-Party Agreement milestones may need to be renegotiated. Hanford Manager Keith Klein disagrees and says changes made in the project – including the start of 24-hour, seven days a week operation – should allow them to eventually get back on schedule.
- The U.S. House of Representatives votes 306-117 to override Nevada's veto of

Yucca Mountain. The matter now goes to the U.S. Senate.

- Bechtel National estimates that construction and operation of the Hanford tank waste vitrification facilities can occur sooner than existing schedules, but at a higher cost. Bechtel estimates that construction and testing can be complete a year early, by 2010. The company estimates that vitrifying ten per cent of Hanford's tank waste can be completed almost five years early, by 2013. Overall cost estimates rise from \$3.965 billion to \$4.447 billion.

June 2002

- DOE and its regulators estimate that about 40 percent of the contaminated soil around Hanford's nine reactors has been cleaned up. About three million tons of contaminated soil and debris have been removed from Hanford's 100 Area.
- The Hanford Thyroid Disease Study concludes that Hanford downwinders are no more likely to have thyroid disease than people who lived elsewhere. The 13 year-long study, conducted by the Fred Hutchinson Cancer Research Center, looked at the thyroid health of 3,440 people, most of them children who lived downwind from Hanford during the years of its largest releases of radioactive materials to the environment.

"We used the best scientific methods available, and we did not find an increased risk of thyroid disease in study participants from exposure to Hanford's iodine 131. If there is an increased risk of thyroid disease, it is too small to observe." — Epidemiologist Paul Garbe, U.S. Centers for Disease Control and Prevention. (Tri-City Herald, June 22, 2002).

Hanford's first chemical reprocessing facility, T-Plant. Radioactive iodine was released from the T-Plant stack during Hanford's early years of operations.

"This does not prove that Hanford radiation has no effect. It doesn't prove it didn't happen to me, just that it cannot be graphed." — Jay Mullen, who grew up in Spirit Lake, Idaho and had thyroid disease. (Tri-City Herald, June 22, 2002).

- Hanford workers successfully complete the conversion of 1,126 gallons of plutonium-laced liquids at Hanford's Plutonium Finishing Plant to a much safer powder. The powder should be baked to an even safer form by a July 31 deadline.



- Construction of Hanford's high-level waste vitrification facilities begins, as structural concrete is poured as part of the 5-foot thick, steel-reinforced foundations and basement walls for one of two waste processing buildings. The project will require 58,000 tons of steel, 160 miles of piping and 1,260 miles of electrical cable. Two cement processing plants have been installed to produce the concrete that will be needed over the next five years.

"The regulators have given us the green light, our construction force is geared up, and our subcontractors are ready." — Ron Naventi, Bechtel's vitrification project manager. (Tri-City Herald, July 10, 2002).



Workers place the first structural steel in the high-level waste treatment facility.

- The Senate overrides Nevada's veto of Yucca Mountain, the final congressional hurdle for the proposed nuclear waste repository northwest of Las Vegas. DOE expects to submit a repository license by December 2004. Clark County, Nevada, the City of Las Vegas and the State of Nevada intend to pursue five lawsuits already pending in federal court.

"I look at their record (in court). And the scoreboard says state of Nevada: zero." — Idaho Senator Larry Craig – who voted

in favor of Yucca Mountain – about Nevada's chances to prevail in court. (Las Vegas Sun, July 10, 2002).

- Washington Attorney General Christine Gregoire tells a Senate committee there are too many unanswered questions for her to support an accelerated cleanup schedule proposed for Hanford, in return for additional cleanup funds. The Attorney General says a faster schedule is welcome, but that the state will remain resolute in its insistence on a full and complete cleanup of dangerous wastes at the site.

"In 13 years since signing the Tri-Party Agreement, we've had (three) presidents and six Secretaries of Energy. Each administration has spent time and money rethinking the Hanford cleanup. Each ultimately came to the same conclusions: there is no quick fix... Let me be clear. Washington State will not sit back and allow the Federal government to declare the Hanford cleanup a success by simply moving the goal line. That is not accelerated cleanup by our standards." — Statement of Washington Attorney General Christine Gregoire to the Senate Committee on Energy and Natural Resources, July 11, 2002.

- The state of Washington files a "friend of the court" petition to participate in a lawsuit against DOE over the issue of leaving radioactive waste in Hanford's underground tanks. DOE is hoping to reclassify some of the waste in the tanks as "incidental to processing" — using a 1999 DOE order to do so. The original suit was filed by the Natural Resources Defense Council, the Snake River Alliance and the Yakama Indian Nation.
- Washington State regulators tell a House subcommittee they are willing to discuss changes to the Hanford cleanup plan, but only if the changes do not result in less cleanup.

"We believe there can be smarter, more cost-effective cleanup and accelerated cleanup within terms of our agreement.

July 2002 continued

What there cannot be, and what we cannot accept, is less cleanup. Less cleanup is not accelerated cleanup. It's just less cleanup." — Mike Wilson, Washington Department of Ecology, to the House Energy and Commerce Committee's oversight and investigation subcommittee. (Tri-City Herald, July 20, 2002).

"Our best chance in defeating Yucca Mountain is in the federal courts, where impartial judges will hear the factual and scientific arguments as to why Yucca Mountain is not a safe place to store this nation's high-level nuclear waste." — Nevada Governor Kenny Guinn. (Associated Press, July 24, 2002).

- President Bush formally approves Nevada's Yucca Mountain as the site of the nation's high-level nuclear waste repository.

August 2002

- Cleanup of the 618-4 burial site near Hanford's 300 Area is about 3 months behind schedule because of more severe soil contamination than predicted. Hundreds of barrels filled with uranium chips and depleted uranium oxide powder were unexpectedly discovered when the burial ground was being dug up in 1998. Work finally began in January to move the barrels out of the burial ground and away from the Columbia River. The barrels are being stored on a concrete pad in the 200 area until final disposal is determined. Only about 800 barrels turned out to be in the burial ground – far fewer than the 1,500 expected.

- Ecology agrees to a DOE plan to accelerate closure of seven underground high-level radioactive waste storage tanks. Under the proposed revision to the Tri-Party Agreement, DOE will begin closing its first tank in 2004 – 10 years ahead of schedule. Seven tanks in all are to be closed by 2011. DOE and Ecology have yet to agree on what defines "closure."

"We intend to beat those milestones, not just meet them, but beat them." — Roy Schepens, manager of DOE's Office of River Protection. (Tri-City Herald, August 16, 2002).



- DOE commits to shipping out the equivalent of two barrels of transuranic waste for every barrel the site takes for temporary storage. In a letter to regulators and stakeholders, DOE-Richland Manager Keith Klein says this will occur within 18 months after receipt of waste from other sites. DOE wants to ship some transuranic waste to Hanford so it can move forward with closing a few smaller sites. Klein also says

Barrels of uranium chips are removed from the 618-4 burial ground.

August 2002 continued

Hanford will eventually refrain from burying low-level waste in unlined trenches and instead will use lined trenches with leachate collection systems. He also asks the public to accept that Hanford will have to take some waste from other sites as part of the nationwide cleanup effort.

"I ask you to consider that we are moving past old approaches to a new collaborative approach to cleanup, working in close partnership with our regulators and others. I ask that you recognize there are many sides to every issue and that rarely are people (or even agencies) acting in bad faith." — Hanford Manager Keith Klein. (Letter to Regulators, Tribal Nations, and Members of the Public, August 22, 2002).

- DOE removes the 100th canister of spent fuel from the K-Basins. About 490 metric tons of

the 2,100 metric tons has been moved. More than 15 million curies of radioactivity has been moved out of the basin and away from the Columbia River.

- DOE and its regulators agree to a tentative schedule to shut down the Fast Flux Test Facility. Under the schedule, submitted for public review, liquid sodium would be drained from the reactor beginning in June 2003. Complete shutdown would be complete by February 2011.
- DOE announces it may fine Fluor Hanford \$137,500 for errors in calibrating radiation detectors. The errors resulted in waste buried in the Environmental Restoration Disposal Facility that was thought to perhaps contain radioactive materials that were not allowed in that burial ground. Although that turned out to not be the case, DOE said the incident created doubt with the public in DOE's abilities to properly handle its waste.

September 2002

- Four spent fuel assemblies from the Shippingport reactor in Pennsylvania — stored in Hanford's T Plant for more than 20 years — are moved to Hanford's canister storage building. Sixty eight additional fuel assemblies are scheduled to be moved to the canister storage building during the next several months. Once that project is completed, Hanford workers will begin to move sludge from the K-Basins to T Plant for storage, as part of the project to clean up the basins.
- A General Accounting Office report says despite massive changes in DOE's contracting, it doesn't appear that its contractors are accomplishing nuclear waste cleanup any better than under the old contracts. DOE has moved from mostly cost-reimbursement contracts to performance based contracts. However, the GAO found that DOE's focus was on changing its contract process, rather than improving cleanup results.

"Poor performance by DOE contractors and inadequate DOE management and oversight of those contractors led us to conclude in 1990 that DOE's contracting practices were at high risk for fraud, waste, abuse and mismanagement... Although DOE has taken a number of reforms over the years...it has no good measure of the results of the reforms... Limited evidence we developed suggests that contractors managing DOE's major projects are performing no better in 2001 than on similar projects in 1996." — (GAO Report GAO-02-798) September 2002.

- DOE announces that the responsibility for work involving the decommissioning and dismantlement of the Fast Flux Test Facility has been

September 2002 continued

transferred from the Office of Nuclear Energy to the Office of Environmental Management.

- Bechtel Hanford workers complete the cocooning of DR Reactor. The DR Reactor becomes the second Hanford reactor to complete the cocooning process.
- Hanford meets an interim deadline for pumping liquid radioactive waste out of its single-shell tanks. The deadline was established in 1998 as part of a federal court decree. More than two and a half million gallons of liquid have been pumped from the single-shell tanks, leaving just over half a million gallons left to pump from 16 tanks.



Before and after photos show the changes at DR Reactor following successful cocooning of the former plutonium reactor.

October 2002

- DOE and CH2M Hill Hanford Group agree to contract incentives to try and close up to 40 of Hanford's single-shell tanks by 2006. The plan is contingent upon – among other things – DOE's ability to certify about one million gallons of waste in the tanks as transuranic waste and ship it off to a disposal site in New Mexico. State regulators say they were not consulted by DOE and many details need to be worked out – including an agreement on what "closing" a tank means.
- The last of nearly 800 barrels of uranium chips is moved from a burial ground just north of the 300 Area. Work is now underway to remove contaminated soil and debris from a neighboring site.
- An exhibit on Hanford opens at Portland's Oregon Museum of Science and Industry. Titled "Hanford at the Half Life," the

exhibit explains Hanford's history as the world's first site to manufacture plutonium for nuclear weapons and its current mission to clean up the enormous amounts of waste generated during more than 40 years of plutonium production. Visitors to the exhibit can measure radiation, discover how radioactive



Part of the Oregon Museum of Science and Industry's Hanford display.

October 2002 continued

waste has seeped into the soil, undergo a radiation exposure screening, and learn about the efforts to control the contamination and protect

the Columbia River. The Hanford exhibit is expected to be on display for at least five years.

November 2002

- Washington Ecology suspends a \$57,800 fine against DOE and Fluor Hanford for mislabeling a potentially explosive chemical. The incident occurred in March 2001. The fine will not have to be paid unless there is a repeat offense.
- Benton County files suit in federal court to prevent the shut down of the Fast Flux Test Facility. DOE agrees to stop decommissioning work for two weeks. DOE had planned to begin draining sodium from the reactor within days.
- Hanford Communities considers levying a surcharge on transuranic wastes shipped to Hanford for temporary storage. Local governments currently receive a surcharge on radioactive waste sent to US Ecology's commercial low-level waste site at Hanford.
- DOE agrees to stop decommissioning work on the Fast Flux Test Facility until March 2003. The delay provides supporters of the reactor additional time to try and convince the federal government to turn the reactor over to private industry for the production of medical isotopes.
- About 150,000 gallons of high-level waste is pumped into tank SY-101 – the first time that waste has been transferred into that tank in several decades. Wastes in SY-101 previously had generated potentially explosive hydrogen – preventing the addition of any wastes.
- No more spent fuel remains in Hanford's 300 Area. The last of about two metric tons of irradiated, commercial spent fuel is moved from the 324 building to the 200 Area.
- The State of Oregon files a "friend of the court" petition to participate in a lawsuit against DOE over the issue of leaving radioactive waste in Hanford's underground tanks. Washington filed as a friend of the court earlier in the year.
- DOE begins moving spent nuclear fuel from the K-East Basin to the nearby K-West Basin, where the fuel will be sorted, repackaged, and then moved to an underground storage vault in Hanford's central plateau. DOE and its contractors have already successfully removed about one third of the 2,100 tons of spent fuel that were in the two basins. That work focused on fuel in the K-West Basin – which is less corroded and damaged than the fuel in the K-East Basin.

"This milestone marks a definite turning point in this very important project, as now most of the fuel in the K-West Basin has already been removed and we can squarely focus on our next major cleanup task...safely processing and storing the K-East Basin fuel." — Keith Thomson, President of Fluor Hanford. (The Hanford Reach, December 2, 2002).

December 2002

- President Bush signs into law a provision that would award South Carolina up to \$100 million a year if the federal government fails to remove surplus weapons-grade plutonium from the state on schedule. Thirty-four metric tons of weapons-grade plutonium is now being shipped to Savannah River from Rocky Flats, Colorado. Savannah River will convert the material into Mixed Oxide (MOX) fuel for commercial nuclear reactors that produce electricity. If the MOX program doesn't meet schedules, or is not successfully operating,

December 2002 continued

DOE must remove all the plutonium from Savannah River or face the fines.

- Hanford workers begin pumping liquid waste from tank C-103, the last of Hanford's single shell tanks which have not had liquids previously pumped. The pumping beats a Tri-Party Agreement milestone by five months. Pumping is now underway on 13 single shell tanks to remove the remaining 460,000 gallons of free liquids. More than 2½ million gallons of liquids have been pumped from the single shell tanks since 1998.



Oregon Department of Transportation truck inspectors begin an inspection at the Ashland, Oregon port-of-entry of a truck hauling remote-handled transuranic waste from a DOE facility in California to Hanford.

- The State of Washington agrees to allow limited amounts of transuranic waste from two DOE sites to be sent to Hanford for interim storage. In return, DOE pledges to reach agreement with the state by March 1 on new Tri-Party Agreement milestones for characterizing and retrieving Hanford's buried mixed wastes. Washington was ready to go to court before the agreement was struck. DOE also agrees to send two barrels of Hanford's transuranic waste out for every barrel received.

"This is the Department of Energy's last chance to get on with the retrieval, processing and permanent disposal of what has been a skeleton in the Hanford closet." — Washington Attorney General Christine Gregoire. (Governor's Office News Release, December 16, 2002).

- Three trucks carrying remote-handled transuranic waste arrive at Hanford from DOE facilities in Ohio and California.
- Hanford workers enter the cocooned C Reactor for the first time in five years. They find only a small oil drip inside the structure and make a minor repair to the roof. Otherwise, the reactor structure is just as it was left when workers sealed the reactor in 1998.
- Hanford area residents and others file a \$108 million lawsuit against the federal government over damage from a 2000 fire that started on the Hanford Site. The fire burned 300 square miles and destroyed 11 homes in Benton City. The lawsuit claims poor land management and inadequate fire-suppression efforts and also claims the fire is responsible for two deaths.

- The Oregon Hanford Waste Board urges DOE and its regulators to take actions now to help protect the Columbia River from Hanford's radioactive and chemical wastes. A report issued by the Board, "River Without Waste," contains 28 recommendations, including ones to construct temporary caps and soil barriers to prevent water from entering waste sites, and prioritizing cleanup of burial grounds along the Columbia River to initially focus on those sites known to be releasing contaminants.
- DOE announces that construction of Hanford's high-level waste vitrification facilities will be delayed by up to 10 months because of poor engineering. As a result, DOE withholds \$3 million in payments to Bechtel National, the lead design and construction contractor. Bechtel officials say they have been working on corrective measures since the problems were discovered in September. DOE says the planned 2007 hot-start of the facilities may need to be delayed.
- Hanford workers complete the removal of 1,055 tons of spent fuel from the K Basins – the equivalent of emptying one of the two basins.
- Two contracts are awarded for initial work on supplemental technologies to treat a portion of Hanford's tank wastes.
- DOE officials say hundreds of millions of dollars can be saved if the pre-treatment process for Hanford's tank wastes does not include removing technetium 99. That would result in much of the technetium being buried at Hanford. DOE contends that technetium accounts for 25,000 curies, or less than 0.02 percent of the 190 million curies of radioactivity in Hanford's tank wastes. Ecology officials and others voice strong concerns about the proposal.



Concrete crews working in the high-level waste treatment facility.



"Without Tc-99 removal, and only two low-activity melters, finding an acceptable, low-cost supplemental technology that is capable of meeting the required standards is nearly impossible...Further, Ecology has grave concerns with what appears to be a trend to minimize the capabilities of the (waste treatment facilities) as it relates to pretreatment and low-activity waste vitrification throughput." — Letter from Mike Wilson of Ecology to ORP Manager Roy Schepens (January 15, 2003).

DOE Office of River Protection Manager Roy Schepens addresses employees at the construction site for the waste treatment plant.

February 2003

- DOE submits a more than two billion dollar request for Hanford's Fiscal Year 2004 funding. The amount represents an increase of between \$37 and \$63 million, depending on the accounting process. It allows an increase in funding for cleanup along the Columbia River, maintains funding for construction of the vitrification plant facilities, and allows for completion, or near completion of the spent fuel and plutonium stabilization projects.

"This is what we wanted to see. Clearly, we'll have to dig into it to see if there are any bugaboos." — Sheryl Hutchison, Department of Ecology spokeswoman. (Tri-City Herald, February 4, 2003).

- An alert level emergency is declared at Hanford after three air monitoring alarms at the K-East Basin go off. All three alarms turn out to be false.
- Hanford workers complete stabilization of several hundred plutonium polycubes at the Plutonium Finishing Plant. The polystyrene cubes, impregnated with pure plutonium oxide, presented many technical challenges that needed to be resolved before they could be stabilized to allow long-term storage.

March 2003

- The State of Washington files suit in federal court to stop DOE from shipping additional transuranic waste to Hanford. DOE and Washington had been working to reach agreement by March 1 on enforceable milestones for the retrieval of buried transuranic waste at Hanford. The legal action comes after those negotiations break down. DOE soon agrees to halt further shipments until oral arguments are heard in mid April.

"We received assurances that the federal government would prepare to ship approximately 78,000 barrels of radioactive waste out of Hanford, if we let another 170 barrels in. But the Department of Energy has not lived up to its end of the bargain, and now they have left us with no choice but to file suit." — Washington Attorney General Christine Gregoire (State of Washington News Release, March 4, 2003).

"The issue isn't whether we're going to get the work done. It's whether we need the state to force us to do the work. We have demonstrated we know what our obligations are and we're committed to carrying them out." — DOE Assistant Secretary Jesse Roberson (Seattle Post Intelligencer, March 5, 2003).

- Washington Ecology Director Tom Fitzsimmons issues a Director's Determination related to the stalled TPA negotiations on retrieving buried solid waste at Hanford. Ecology requires DOE to submit a detailed plan and schedule by August 31st of this year for developing storage and treatment facilities needed to handle these wastes, and gives DOE until mid 2012 to actually have these facilities in operation. DOE has 30 days in which to appeal the action.
- The 200th canister of spent nuclear fuel is sent from the K-Basins to the Canister Storage Building.

April 2003

- EPA levies a \$76,000 fine against DOE for failing to begin the removal of nearly 50 cubic meters of sludge from Hanford's K-East Basin.

Under the Tri-Party Agreement, that work was to have begun by December 31, 2002.

April 2003 continued

- Four activist groups sue DOE, seeking to prevent further shipments of radioactive waste from coming to Hanford. Heart of America Northwest, Columbia Riverkeeper, the Sierra Club and the Washington Physicians for Social Responsibility say the Bush Administration has failed to consider the potential for a terrorist attack on transuranic waste being shipped by truck on public highways.
- The Ninth U.S. Circuit Court of Appeals refuses to stop decommissioning of the Fast Flux Test Facility. Benton County had sought an injunction to prevent DOE from draining the sodium from the reactor or doing other, irreversible work on the reactor. Fluor Hanford is expected to begin draining the sodium within the next week.

*"I don't know if they knew they were sentencing (the reactor) to death. The scenario before us tonight is lose-lose."
— Benton County Commissioner Claude Oliver (Tri-City Herald, April 4, 2003).*

- Workers begin draining hot liquid sodium from a secondary cooling loop of the Fast Flux Test Facility, effectively beginning the permanent shutdown of the reactor.

*"It's one of the most gut-wrenching experiences I can imagine on so many levels."
— Wanda Munn of Richland, a retired FFTF engineer (Tri-City Herald, April 8, 2003).*

- DOE files suit against the State of Washington in response to Washington's imposition of TPA milestones for retrieving buried solid waste at Hanford.

*"Recent actions by the state of Washington could have a chilling effect on cleanup operations at Hanford and elsewhere."
— DOE Assistant Secretary Jessie Roberson (Tri-City Herald, April 10, 2003).*

"The only chilling effect on Hanford's cleanup was (DOE's) decision to walk away from a negotiated settlement to dispose of (84,000) barrels of transuranic wastes at Hanford." — Washington Attorney General Christine Gregoire (Tri-City Herald, April 10, 2003).

"The unraveling of the relationship between the state and the Department of Energy is bad for this community...A court ruling could be long in coming and has the potential to undermine the Tri-Party Agreement's effectiveness...The trust necessary to hammer out cleanup particulars will be lost, and the estrangement will invite the rise of fringe groups to bog down the discussion." — Tri-City Herald Editorial (April 22, 2003).

- DOE awards a \$1.05 billion contract for work on the Columbia River Corridor to the Washington Closure Company, headquartered in Boise. The contract includes cocooning of three reactors, cleaning up 269 waste sites and 46 burial grounds, and demolishing surplus buildings. The contract includes an option for additional work. Washington Closure Company is made up of three companies, Washington Group International, Fluor Federal and Earth Tech.



Clean-up work near the N Reactor.

April 2003 continued

- For the first time in 14 years, the United States regains the ability to make nuclear weapons pits. Scientists at Los Alamos National Laboratory build a plutonium pit for a W-88 warhead for a Trident nuclear missile. Plutonium pits were previously made at Rocky Flats in Colorado. Rocky Flats was shut down in 1989 after the FBI raided the plant because of violations of environmental laws. DOE will begin limited production of pits and other components for the existing stockpile of nuclear weapons.

"Since 1989 until today, we were the only nuclear power in the world that could not make a pit." — Linton Brooks, administrator of the National Nuclear Security Administration (Los Angeles Times, April 23, 2003).

"It is a sign that after a long period of decline, the weapons complex is back and growing. To the average U.S. citizen, it would be accurate to say we have restarted

the production of nuclear weapons."
— Jon Wolfsthal, deputy director of the Carnegie Endowment for International Peace (Los Angeles Times, April 23, 2003).

- Ecology issues an Administrative Order against DOE for violating the state's hazardous waste laws for failing to manage radioactive hazardous wastes buried in unlined trenches at Hanford. The state issues the order independently of the Tri-Party Agreement, contending the waste poses an "imminent and substantial endangerment to public health and the environment." The Order requires DOE to retrieve the wastes by certain deadlines.

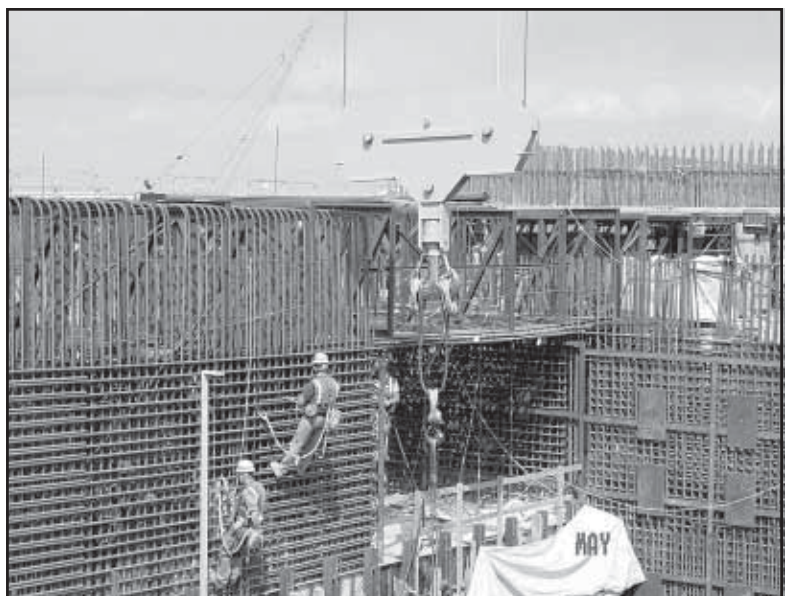
"We have tried exhaustively to establish a cooperative relationship with the Department of Energy to improve the pace of cleanup at Hanford, but we have been thwarted by shifting policies and broken promises."
— Ecology Director Tom Fitzsimmons (Ecology News Release, April 30, 2003).

May 2003

- Federal Judge Alan McDonald orders DOE to not ship transuranic wastes to Hanford until he can rule on a request by the State of Washington and four citizen activist groups to issue an injunction against such shipments.
- Bechtel files a protest over the award of a \$1 billion cleanup contract to the Washington Closure Company for work along the Columbia River. Bechtel has been doing the river corridor cleanup work for the past nine years.
- DOE adopts a new schedule for the start up of the vitrification plant. The new plan calls for construction to last until 2008 or early 2009. Tests with simulated waste would begin in 2009 or 2010, and tests with actual radioactive wastes would begin in 2010, not in 2007 as required by the Tri-Party

Agreement. The DOE plan does meet the Tri-Party Agreement deadline of having the vitrification complex fully operational by January 31, 2011. Ecology has not yet agreed to the schedule changes.

Iron workers tying rebar in the pre-treatment plant.



May 2003 continued

- DOE orders its contractors to halt some cleanup work at Hanford, saying a state Administrative Order leaves them no alternative. The Order said DOE should stop activities that would add to the backlog of untreated mixed waste. DOE says this will impact cleanup work at the Plutonium Finishing Plant, work in the tank farms, and removal of sludge from the K-Basins.

"We have no options. We have to comply." — Keith Klein, Hanford manager (Associated Press, May 9, 2003).

"This is completely ludicrous – to think that what we're calling for is for cleanup activities to stop. This is one sentence in a many-page order they're quibbling about." — Sheryl Hutchison, Ecology Department spokeswoman. (Associated Press, May 9, 2003).

- U.S. District Judge Alan McDonald grants a temporary injunction, prohibiting shipments of transuranic wastes to Hanford until litigation over the wastes is resolved.

- Ecology temporarily suspends part of its Administrative Order which DOE interpreted as forcing a shutdown of some cleanup work. The state asks DOE to evaluate specific impacts from strict compliance with the order. DOE orders all cleanup work at Hanford to resume.
- The Tri-Parties agree to new milestones for decommissioning the Fast Flux Test Facility. The new milestones include initiating sodium drain of the first secondary loop by June 2003 (which has already been done), and completing sodium drain by September 2009.
- Revised construction plans for Hanford's waste vitrification facilities will require fewer construction workers than previously assumed, but the workers that are hired will stay on the job longer. Bechtel originally expected to hire as many as 3,500 construction workers by 2005 before major layoffs would start. Now, it appears the total will peak at slightly more than 2,000 in 2006, before dropping significantly. The project currently employs about 1,000 blue-collar workers.

June 2003

- The Yakama Nation announces its intent to sue the federal government for its failure to protect the Columbia River from Hanford contaminants. The tribe contends damages to the natural resources – particularly salmon – from chemicals and radioactive materials released into the Columbia River.

"We have to do whatever is necessary to see that our river is fully healed and the salmon runs restored." — Ross Sockzehigh, Yakama Tribal Council chairman. (Associated Press, June 6, 2003).

- A coalition of citizens groups announce the filing of a ballot measure in Washington state for the November 2004 election that would ban new imports of hazardous and radioactive wastes to Hanford. The initiative would also ban the use of unlined soil trenches for waste

disposal and require cleanup of contaminated groundwater. The initiative needs 197,000 valid signatures to make the ballot.

"Long-term insidious dangers to public health exist at Hanford due to the massive amounts of uncontrolled radioactive and chemically-hazardous wastes there. Importation of additional wastes before Hanford is safely and legally cleaned up defies logic." — Charles Weems, M.D., of Washington Physicians of Social Responsibility. (Citizen Group News Release, June 7, 2003).

- The states of Washington and Oregon, the Yakama Nation, The Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Hanford Advisory Board, the

June 2003 continued

Oregon Hanford Cleanup Board, and others, conclude that the latest version of the draft Hanford Solid Waste Environmental Impact Statement is still deficient.

- A GAO report says DOE faces significant legal and technical challenges to successfully reduce the costs and time required for cleanup of its high-level wastes, including the 53 million gallons of waste stored in Hanford's underground tanks. A key legal challenge cited involves DOE's authority to decide that some waste with relatively low concentrations of radioactivity can be disposed on site.

A key technical challenge cited is that DOE's approach relies on laboratory testing to confirm separation of the waste into high-level and low-activity portions.



A low-level waste burial trench at Hanford.

July 2003

- Federal Judge Lynn Winmill overturns a DOE Order that would have allowed DOE to reclassify high-level radioactive waste and leave it at Hanford and two other DOE sites. Judge Winmill rules that DOE Order 435.1 directly conflicts with provisions of the 1982 Nuclear Waste Policy Act.

"DOE does not have discretion to dispose of defense (high-level waste) somewhere other than a repository established under (the Nuclear Waste Policy Act)."

— From the decision by Federal Judge Lynn Winmill (July 3, 2003).

"You can't just call a monkey a turkey and say it doesn't need to be in a cage. They can't do cleanup on the cheap – they've got to deal with the high-level waste." — Sheryl Hutchison, Washington Department of Ecology. (Associated Press, July 3, 2003).

- Ecology and DOE reach agreement on a new schedule for bringing the vitrification facilities on-line. The operational date of 2011 remains the same. Under the proposed new schedule, construction will mostly end by 2008, with operational testing beginning by February 2009 with surrogate waste and "hot" testing beginning in 2010. DOE also has a January 2005 deadline to report to the state on proposed technologies to supplement vitrification.

- A General Accounting Office report says DOE's environmental cleanup program relies on untested technologies and faces potentially crippling legal challenges.



Pressure vessel for the pre-treatment facility.

July 2003 continued

- The Waste Treatment Plant Project's first structural steel is placed in the low-activity waste treatment facility, beating a Tri-Party Agreement milestone by three months.
- A range fire burns about 2,000 acres on the edge of Rattlesnake Mountain, including about 300 acres of the Arid Lands Ecology Reserve.

August 2003

- Energy Secretary Spencer Abraham writes to House Speaker Dennis Hastert, saying a recent federal court decision on high-level waste classification may cause decades of delay in cleanup and substantially increase costs. He asks Congress to re-open the Nuclear Waste Policy Act, to clarify that DOE has the authority to define high-level waste.
- DOE fines Fluor Hanford \$550,000 for safety problems at Hanford's T Plant. The fines were for crane safety incidents in January and safety problems last October that led to a spread of some contamination.
- Slightly radioactive mud dauber nests are found during cleanup of Hanford's H Reactor.
- Workers at the Plutonium Finishing Plant complete the processing of plutonium-laced residues. That leaves just the conversion of plutonium-laced solids into safer forms to complete the stabilization of Hanford's stored plutonium.
- The General Accounting Office suggests that DOE should re-evaluate its award of a \$974 million Hanford cleanup contract, which was awarded to the Washington Closure Co. in late April. Bechtel National, which is currently performing the cleanup work, had challenged DOE's decision.
- Three million gallons of tank waste have now been pumped from Hanford's single shell tanks since a court ordered agreement went into effect in 1998. Just 7,000 more gallons of waste have to be pumped by September 30 to reach a deadline to remove 98 per cent of the original 3.1 million gallons of liquid waste that was present when the court agreement was reached. The remaining two per cent of the pumpable liquids must be removed within the next year.
- Following a visit by President Bush to the Tri-Cities area, the Tri-City Herald calls on the

President to demonstrate his commitment to Hanford cleanup.

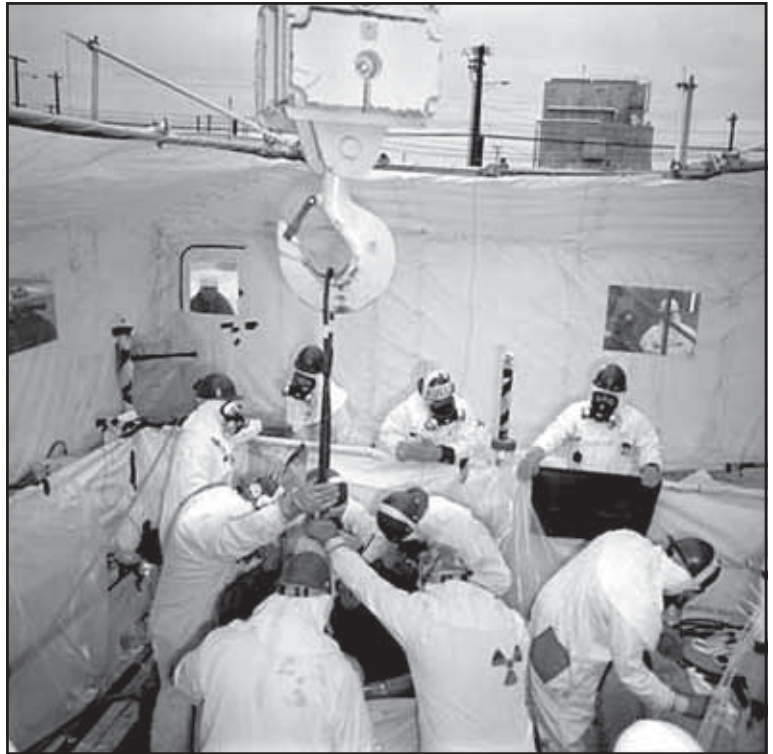
"As it stands, the past 2½ years have left plenty of room for doubt about your administration's intentions for cleaning up the nation's worst nuclear mess that sits in our back yard...Our congressman, Doc Hastings of Pasco, tells us we should applaud your administration's strategy to speed up cleanup. We do, in theory....But it's the reality that concerns us. If doing cleanup faster means cutting corners, that will betray this community. While your Department of Energy seems at times to say all the right things, its actions don't always back up those words." — Tri-City Herald Editorial (August 22, 2003.)

- The attorneys general from Oregon, Washington, Idaho and South Carolina send a letter to Congress, opposing DOE's attempts to reclassify high-level radioactive waste. DOE has asked Congress to amend the Nuclear Waste Policy Act and other laws to give them that authority, following a Federal district court ruling which threw out a portion of an internal DOE order.

"In our view, amendment of federal law is wholly unnecessary to remedy the defects the court identified in the Department's internal policies. Moreover, enactment of the proposed legislation would merely serve to do what the states objected to in the first instance by giving the Department unbounded discretion to reclassify high-level radioactive waste." — Letter from the Attorneys General of Oregon, Washington, Idaho and South Carolina to the Congressional Leadership. (August 28, 2003).

September 2003

- DOE fines CH2M Hill Hanford Group \$82,500 for environmental safety violations at a Hanford tank farm. The violations included the accidental shut off of leak detectors at two tanks and failure to provide adequate controls to keep vehicles from driving over buried tanks. The violations occurred between April and November of last year. Because of improvements that have occurred since then, the fine was reduced by half.
- The Government Accountability Project says Hanford's tank farm workers are repeatedly being exposed to hazardous chemical fumes. A GAP report says workers' protective breathing equipment and equipment to monitor vapor releases are inadequate to protect workers from chemicals leaking from Hanford's waste storage tanks. GAP says from January 2002 to August 2003, 67 tank farm workers required medical attention for problems including headaches, skin irritation, and breathing difficulties, a sharp increase from 15 years ago. DOE and CH2M Hill officials declined to comment on the specifics of the report, but said reported incidents had increased because of more stringent reporting requirements.



Hanford tank farm workers.

"Hanford tank workers are like canaries in a coal mine." — Tom Carpenter, GAP attorney. (Tri-City Herald, September 16, 2003).

- Tom Fitzsimmons resigns as Director of the Washington Department of Ecology to become Governor Locke's Chief of Staff. Linda Hoffman is named interim director.

October 2003

- The U.S. House of Representatives goes on record as opposing an effort by DOE to reclassify high-level radioactive waste at Hanford and two other DOE sites. By unanimous voice vote, the House approves a motion instructing House conferees negotiating energy legislation with the Senate not to amend the Nuclear Waste Policy Act to give DOE authority it is seeking to reclassify high-level waste.
- DOE and Ecology reach agreement on a schedule for retrieving, storing and processing certain buried waste at Hanford. The agreement resolves major portions of two Hanford cleanup

orders issued last spring by Ecology and nearly ends more than two years of disagreements, administrative actions and litigation. Questions about who has jurisdiction of the waste prior to its characterization will continue through the legal process. Under the agreement, DOE will begin retrieving suspect contact-handled transuranic waste by November 15 and complete retrieval of this waste by 2010. The waste was buried between 1970 and 1988 – mostly in barrels – and was intended to be dug up at some point. Retrieval of remote-handled transuranic waste will begin by 2011, and DOE will have the capability to treat such waste by

October 2003 continued

2012. The agreement also specifies annual volume requirements to assure that adequate progress is being made on retrieval, characterization and treatment of the waste.

"Fourteen years after the Tri-Party Agreement was first signed, we finally have cleanup milestones for the largest remaining block of waste at Hanford. This is a tremendous win for Hanford and the people of Washington." — Ecology Interim Director Linda Hoffman. (Washington Department of Ecology News Release, October 24, 2003).

"This agreement signals a return to a more cooperative and collaborative approach to the challenges presented by the cleanup of this complex site." — Hanford Manager Keith Klein (DOE News Release, October 24, 2003).

- Fluor begins digging up barrels of suspect transuranic waste from Hanford's low-level burial grounds, beating a deadline agreed to days before by several weeks.

"We're acting now before these drums can further degrade, become harder to retrieve, and affect the environment." — Hanford Site Manager Keith Klein. (DOE News Release, October 27, 2003).

A transuranic waste burial trench.

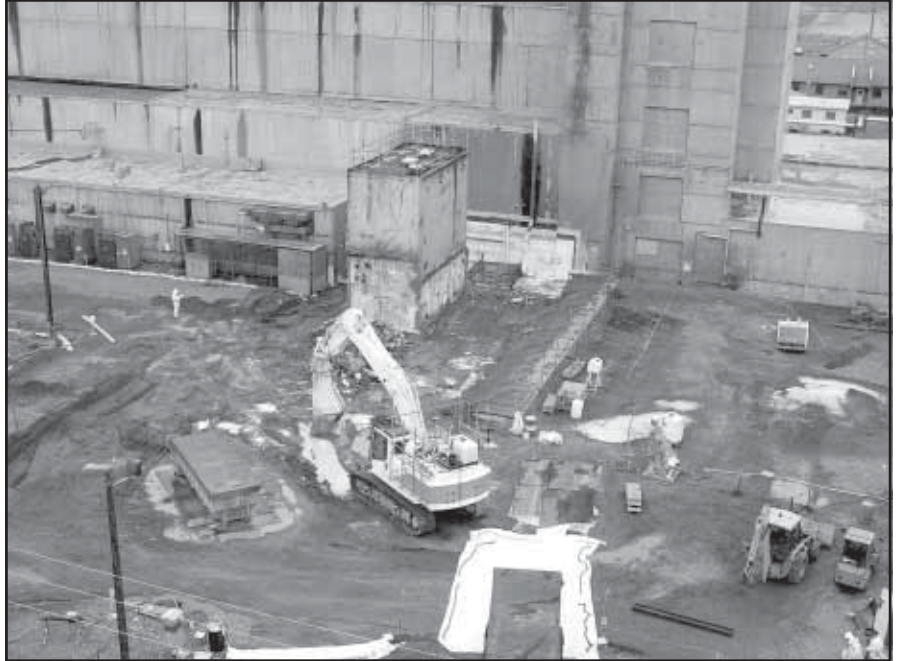


- DOE discovers that hexavalent chromium is breaking through a chemical barrier in the 100-D area at six of 65 wells. Hexavalent chromium is also found in river tubes installed immediately adjacent to, and below the high water elevation of the Columbia River, close to salmon spawning redds.
- Successful retrieval of waste from tank C-106 is proceeding. The bottom of the tank is seen during modified sluicing operations. The addition of oxalic acid appears successful in breaking up the solids in this tank. This tank is the first to reach a possible interim closure state.
- Hanford's plans to send some tank waste it says is transuranic to the Waste Isolation Pilot Plant is being opposed by the State of New Mexico. Hanford officials say about one million gallons of waste in eight tanks is transuranic waste, even though it has been managed for many years as high-level waste. New Mexico Governor Bill Richardson orders his state environment department to change WIPP's New Mexico permit to specifically forbid it from accepting any reclassified high-level wastes.

November 2003

■ Hanford workers begin to tear down the 233-S facility, the site's first large plutonium-contaminated structure to be dismantled. The 3,500 square foot, three story facility is expected to be demolished in about four months. It is the first large plutonium-contaminated facility that will be demolished at a DOE site without being covered by a tent.

■ The New Mexico Environment Department proposes changes to its permit for the Waste Isolation Pilot Plant (WIPP). The proposal would prohibit disposal of waste that was not on a baseline inventory when the WIPP permit was originally approved. That change could prevent certain wastes at Hanford from going to WIPP for disposal. The change was



Demolition work on the 233-S facility.

prompted by fears from New Mexico officials that DOE intends to reclassify high-level radioactive waste in order to send it to WIPP.

December 2003

■ The cocooning of F Reactor is completed ten months ahead of schedule. It is the third Hanford reactor to be sealed up. Bechtel finished cocooning C Reactor in 1998 and DR Reactor in 2002. F Reactor was the third Hanford reactor to produce plutonium, starting up in February 1945 and shutting down in June 1965.

■ DOE announces a decision to pursue development of just one supplemental technology for

use in immobilizing low-activity waste from Hanford's tanks. DOE says bulk vitrification shows the most promise among three technologies being evaluated.

■ Following the discovery of elevated chromium levels in groundwater in the 100-D area, Ecology asks DOE to cut and cap water lines that are potentially leaking, extend a chemical barrier, and take additional samples to find the source of the contamination.

- Supporters of an initiative to ban off-site radioactive waste from coming to Hanford submit 282,000 signatures to the Washington Secretary of State's Office. If 197,734 of the signatures are valid, Initiative 297 will go to the Legislature. The Legislature must either enact the initiative or let the voters decide on its fate in November. The Legislature also has the option of proposing its own measure – both versions would then go to the voters.
- Washington state files suit against DOE, seeking \$6.8 million on a tax bill originating from the late 1980s, when Hanford was one of three sites being considered for a high-level nuclear waste repository. The Nuclear Waste Policy Act allowed states being considered for the repository to receive federal money equal to the taxes that a private company would have paid for sampling and studying the site.
- DOE says waste retrieval efforts on tank C-106 are virtually complete. The tank is being used to demonstrate retrieval and closure. Less than an inch of granular solids remain in the bottom of the tank. Workers used a mild acid six times to dissolve sludge, and sluiced the tank four times, aiming water nozzles at piles of sludge at the bottom of the tank. DOE will work with Ecology to determine if the tank has had enough waste removed to be considered empty under the Tri-Party Agreement, or if Hanford workers will be asked to try to remove more waste.

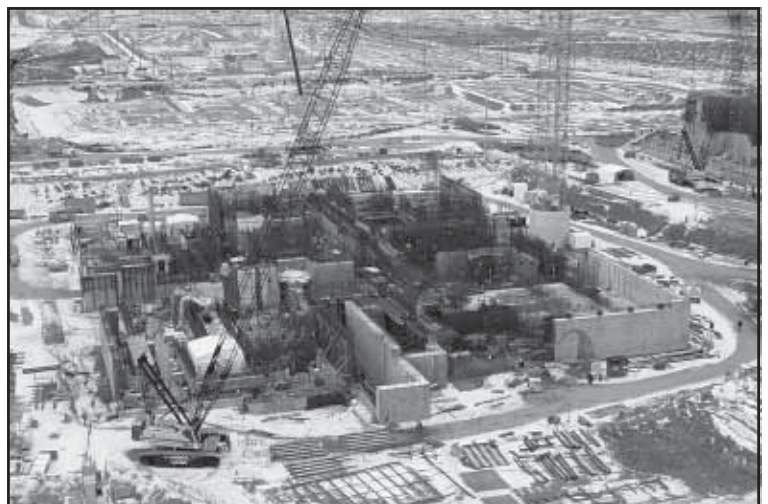
"In many areas of the tank you can see the bottom." — Moses Jarayssi, CH2M Hill Hanford. (Tri-City Herald, January 14, 2004).

- DOE expects Hanford cleanup employment to begin a decline in 2006, with some 4,000 jobs disappearing by 2008. Hanford's employment peak was in 1945 with about 51,000 workers – when the original construction was nearing completion. Its low for employment was 6,500 workers in 1971. The peak of cleanup employment occurred in 1994, with 18,500 workers. There are currently about

11,000 workers at Hanford, in addition to some 3,500 working for Pacific Northwest National Laboratory. By 2028, 2,400 cleanup jobs are expected to remain.

- A new DOE Office of Science has become the third DOE operation at Hanford. The Office of Science is in charge of Pacific Northwest National Laboratory and shares responsibility for the HAMMER training complex. Paul Kruger manages the office.
- Congress directs the Army Corps of Engineers to review escalating costs for constructing Hanford's vitrification plant. Twelve to fifteen Corp officials will be at Hanford through April to prepare an independent assessment of the costs to build and begin operating the vitrification facilities. Three years ago, costs were estimated to be \$4.35 billion. Last year, cost estimates increased by 33 per cent to an estimated \$5.78 billion. Results of the Corp's review will be used by Congress as it works on the 2005 budget for Hanford.

"This increase reflects a troubling lack of accountability at the (DOE) for prior costs and schedule estimates, and does not inspire congressional confidence in the reliability of the current cost and schedule baseline for this project and for other major cleanup projects." — House and Senate conference committee report that ordered the Corps review. (Tri-City Herald, January 29, 2004).



Aerial view of the high-level waste facility.

January 2004 continued

"We need the confidence of Congress to deliver \$690 million (each year) through 2007." — John Eschenberg, DOE-ORP project manager for the vitrification plant. (Tri-City Herald, January 29, 2004).

- Initiative 297, which would ban new imports of hazardous and radioactive wastes to Hanford, is certified by the Secretary of State. That means the Legislature must now enact the initiative or send it to the voters on the November ballot. The initiative would also ban the use of unlined soil trenches for waste disposal and require clean-up of contaminated groundwater. Some Tri-City area-legislators and others are concerned the initiative may end up harming clean-up efforts.

"The only hope is to try to fight the initiative head on. Who has the resources to put up that kind of education program? I don't know. The burden falls on the Tri-Cities." — Representative Jerome Delvin, Richland (Tri-City Herald, January 30, 2004).

- Senator Pat Hale of Kennewick asks the Attorney General's office to rule on several questions pertaining to whether Initiative 297 conflicts with the U.S. Constitution, federal laws, and the Tri-Party Agreement.

February 2004

- The Bush administration proposes a \$2.07 billion budget for Hanford cleanup in fiscal year 2005. The budget is a \$48 million increase over the budget estimate for the current fiscal year. The overall budget request for DOE has \$350 million – including \$64 million for Hanford – set aside for tank waste work, which can be used only when legal issues concerning DOE's ability to reclassify high-level waste are resolved to DOE's satisfaction.
- The Hanford Advisory Board celebrates its tenth year of existence. The Board has issued 155 pieces

of consensus advice to DOE, Ecology and EPA on policy issues related to Hanford cleanup.

- DOE releases the final Hanford Solid Waste Environmental Impact Statement. The document ratifies a previous DOE decision to send low-level and mixed low-level radioactive waste from throughout the DOE complex to Hanford for disposal. Hanford proposes to build a large, lined trench to handle much of this waste.

- Workers at the Plutonium Finishing Plant successfully complete the stabilization of all plutonium at the facility. About 2,250 triple-packed, stainless steel containers of plutonium will remain in PFP's vaults indefinitely. DOE hopes to eventually ship the plutonium to the Savannah River Site. Work will now transition to cleaning up and tearing down the 61 buildings that make up the PFP complex.



Retrieval of buried transuranic waste.

February 2004 continued



DOE Richland Manager Keith Klein.

"What we mark today is a real turning point in Hanford history and the cleanup process." — Keith Klein, DOE Richland Manager. (Tri-City Herald, February 21, 2004.)

- Washington Attorney General Christine Gregoire and other state agency representatives are examining occupational safety complaints from Hanford workers. The inquiry was prompted by a September 2003 report issued by the Government Accountability Project, saying that vapors from underground tanks are causing a serious health hazard. The National Institute for Occupational Safety and Health also plans a visit to Hanford to review safety procedures at the tank farms. Officials for CH2M Hill, which maintains the tanks farms for DOE, say they have taken a number of steps to reduce the hazards since the GAP report was released.
- DOE's Office of Independent Oversight and Safety Assurance joins an investigation into allegations of supervisor misconduct, fraud and medical records mismanagement by officials with the Hanford Environmental Health Foundation (HEHF). The DOE Office of Inspector General is also asked to participate in the investigation. Allegations of misconduct include violation of patients' medical privacy rights, employee harassment and mismanagement of employee medical care. HEHF has provided occupational medicine services to workers at Hanford since 1965 but lost a bid award in January to retain the contract.
- Bechtel Hanford is awarded 100 per cent of the available fee for achieving significant progress on cleanup. Since Bechtel began cleanup work in 1994 it has earned 96 per cent of the annual available fees but this marks the first time it received all the available fee. In 2003, Bechtel workers cleaned up 49 waste sites, completed cocooning the F Reactor, and operated the Environmental Restoration and Disposal Facility.
- A "60 Minutes" report says security at DOE's nuclear weapons factories and research labs is inadequate. 60 Minutes quotes a DOE nuclear security specialist who says mock attacks on nuclear facilities were successful 50 per cent of the time. DOE officials say nuclear materials are secure but that they are working to improve security. Hanford is not mentioned in the report, which details security lapses at several sites such as Rocky Flats and Oak Ridge.
- The State of Oregon expresses concern over DOE plans in the Final Solid Waste EIS to irreversibly and irretrievably commit groundwater underneath much of the Hanford Site, even though DOE's analysis says there should be little to no impacts on groundwater from proposed new waste disposal activities.

"Several instances have been brought to my attention of providers actually encouraging workers to file stress claims, and the outrage of two of the major contractors that was reflected back to my office was swift...We could be invited off the site when our contract comes up for rebid if that behavior continues...please do not encourage workers to file workers' compensation claims...You can, and we must by law, state that they have the right to do so, but please, no frank encouragement."
— Internal e-mail written in 2000 from Dr. Larry Smick, HEHF acting medical director to all HEHF medical providers and nurses. (Tri-City Herald, February 27, 2004).

February 2004 continued

"DOE's analysis indicates that the groundwater resource beneath the proposed facility remains free from impact and therefore may be appropriated for future beneficial uses. Selecting the preferred alternative gives no relief from responsi-

bility for cleaning up already-existing groundwater contamination."
— Letter from Oregon Department of Energy Director Michael Grainey to Hanford Manager Keith Klein (February 27, 2004).

March 2004

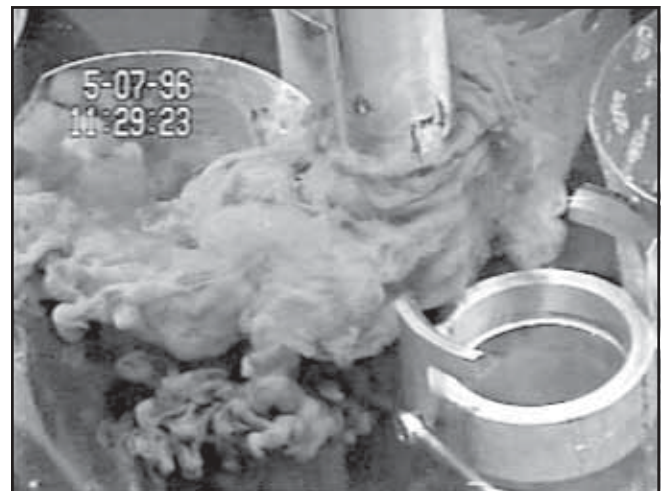
- A Hanford Environmental Health Foundation official says DOE is trying to deflect attention from environmental cleanup issues by focusing attention on HEHF.
- Ecology Director Linda Hoffman, in a letter to Energy Assistant Secretary Roberson, questions whether it is appropriate to ship more waste to Hanford when large portions of the site currently do not comply with federal hazardous waste requirements. In comments tied mostly to the recently issued Hanford Final Solid Waste Environmental Impact Statement, Hoffman agrees that Hanford may have an appropriate role in disposing of the nation's Cold War waste, but states most Washington residents oppose accepting newly generated waste from ongoing nuclear weapons and research operations. She requests an opportunity for "thoughtful conversation" about how to proceed.

"...we have continuing concerns that Hanford could become a national dumping ground for large volumes of radioactive and hazardous wastes, offsetting the progress on cleanup." — Letter from Ecology Director Linda Hoffman to Energy Assistant Secretary Roberson (March 9, 2004).

- The Defense Nuclear Facilities Safety Board says a DOE plan to begin removal of sludge from the K-Basins is not adequate. DOE contractors had planned to soon begin removal of the least contaminated sludge, but the DNFSB says plans are still lacking for removal of the remaining sludge – which is much more contaminated. The start of the project is

already 14 months behind schedule. DNFSB has asked for a revised plan by April 30 that includes the disposition path for each sludge type and for any irradiated fuel or fuel fragments found in the sludge, and revised milestones for the completion of sludge removal from both basins.

"The board considers that the startup of a process that applies only to a small fraction of the sludge...would not satisfy the Implementation Plan commitment to begin sludge removal." — Letter from DNSFB Chair John Conway to Energy Secretary Abraham. (March 3, 2004)



Sludge stirred up in one of the K-Basins.

- Work is halted at the K-Basins after a hoist rolls off the end of an overhead track system and crashes onto the steel grating above the spent fuel pool. No one is hurt.

March 2004 continued

- In a letter to Flour Hanford, DOE-Richland Manager Keith Klein expresses concerns about the safety environment at the K-Basins, saying the hoist incident is just one of many issues that cause concern. Other events of concern during the past year include delayed notification to DOE, inadequate engineering processes, physical altercations between workers and misplaced equipment.

“(DOE) believes that these events may indicate a recurring breakdown of formality and discipline required to safely perform operations at K Basin” — Letter from Keith Klein to Fluor Hanford President Ron Gallagher (March 12, 2004).

- EPA joins Oregon in challenging DOE’s declaration of groundwater underneath much of the Hanford site as irreversibly and irretrievably committed, because of expected actions analyzed in the final Hanford Solid Waste EIS.
- EPA says DOE will face additional fines up to \$500,000 if it does not soon have a plan to remove contaminated sludge from the K-Basins. DOE is given until May 1 to develop an acceptable plan and schedule for removing the sludge.

“I believe EPA has been extremely patient...however, continued delay of remediation of the K-Basins is unacceptable to EPA...We believe DOE’s proposed actions to delay completion of sludge removal from the K-Basins by nearly 2 years...demands that we set a firm deadline...” — Letter from EPA’s Michael Gearheard to Keith Klein (March 22, 2004).

- Washington, Oregon, Idaho and three other states file a friend-of-the-court brief, asking an appellate court to uphold a federal judge’s ruling that DOE’s internal processes for reclassifying high-level radioactive waste violates the Nuclear Waste Policy Act. DOE is appealing the earlier ruling and says it will cause delays in cleaning up tank wastes at Hanford, Savannah River and the Idaho National Engineering and Environmental Laboratory.

- Most work at Hanford’s tank farms is halted because of continuing worker safety concerns over exposure to vapors from the underground tanks. Only essential workers are allowed in the tank farms and they will be required to wear respiratory protection. Up to 11 workers in recent days and more than 40 workers since January 2002 have reported exposures to vapors from the tanks. DOE, the National Institute of Occupational Safety and Health, the state Attorney General’s office and the Washington departments of Health and Labor and Industry are all looking into worker safety issues at Hanford.

“This increase in exposures appears to indicate the actions being implemented are not sufficient and has elevated our concerns for the continued safety of tank farm workers.” — Letter from Roy Schepens, DOE manger of the Office of River Protection to CH2M Hill President Ed Aromi. (Tri-City Herald, March 30, 2004.)

- Former Hanford contractors will not necessarily be able to avoid liability for possibly exposing downwinders to radioactive emissions. A federal judge rules that the five companies cannot simply claim they were following government orders when they operated Hanford. The first downwinder case, filed in 1990, is expected to go to trial in 2005.

“The United States has sovereign immunity, but the United States is not a defendant in this action. The plaintiffs brought suit against the government nuclear weapons contractors who operated the Hanford facility.” — Ruling from U.S. District Judge William Fremming Nielsen (Seattle Post Intelligencer and Associated Press, March 31, 2004).

- Energy Undersecretary Robert Card submits his resignation, just days after facing hostile questioning at a Congressional hearing about DOE's handling of a program to compensate workers who became sick because of their jobs at federal nuclear sites. Card, appointed Undersecretary in 2001, says progress is being made in the compensation program. Beverly Cook, assistant secretary for environment, safety and health, also resigns. Both cite personal reasons.

- The Seattle Post-Intelligencer's editorial board criticizes DOE's attempts to force a change in the Nuclear Waste Policy Act by withholding cleanup funds at Hanford and other sites.

"If Congress, Washington and other states fail to stand firm, the administration will get away with its Alice in Wonderland plan to have Hanford considered clean because the Energy Department says it is."
— (Seattle Post-Intelligencer, April 12, 2004).

- The Director of New Mexico's Environment Department threatens to shut down the Waste Isolation Pilot Plant in 30 days if DOE persists with its attempts to bring radioactive sludge to the site. The state also threatens to block a planned 2006 expansion of WIPP. New Mexico is opposed to bringing waste from Hanford's underground storage tanks – waste that has been previously managed as high-level waste. DOE says some of the waste does fit the disposal criteria for WIPP, and is no more hazardous than other waste that has been disposed there. Within days, New Mexico Governor Bill Richardson says he remains opposed to reclassification of high-level waste so that it could be sent to WIPP, but says WIPP will not be closed down over this issue.
- Workers at Hanford's single-shell tank farms are required to wear self-contained air tanks because of concerns about harmful vapors. The tank farm contractor, CH2M Hill, had previously banned the use of the devices, saying that were not necessary and expressing concern that the restricted visibility would cause workers to

trip and fall. CH2M Hill is also expanding its monitoring of tank vapors.

"We are definitely erring on the side of caution." — CH2M Hill spokeswoman Joy Turner. (Tri-City Herald, April 21, 2004).

- A Vermont nuclear plant reports that two pieces of a spent fuel rod are missing, and may have been mixed in with a shipment of low-level waste sent to Hanford or another site for disposal. One of the missing pieces is about the size of a pencil. The other piece is about the thickness of a pencil and 17 inches long.

"We do not think there is a threat to the public at this point. The great probability is this material is still somewhere in the (spent fuel storage) pool." — Nuclear Regulatory Commission spokesman Neil Sheehan. (Associated Press, April 22, 2004).

- DOE says it needs \$33 million this year and \$43 million in additional funds next year to speed processing of a severe backlog of workers compensation cases for workers at Hanford and other DOE nuclear sites. Since the program began more than two years ago, only a single person has been paid as compensation for illnesses caused by on-the-job exposures to toxic chemicals.

"We underestimated the level of interest in the program and got off to a slow start." — Tom Rollow, director of the Office of Worker Advocacy for DOE. (Tri-City Herald, April 22, 2004).

- A DOE Inspector General audit shows Hanford contractors generally reported worker exposures to chemical vapors correctly when recording injuries.
- A General Accounting Office Report says that while DOE has made significant improvements in physical security at its nuclear facilities since the September 11, 2001 terrorist attacks, they are not sufficient to ensure all DOE sites are adequately prepared to defend themselves

April 2004 continued

against the higher terrorist threat that is now present. The GAO criticizes DOE for taking two years to develop a design basis threat – a classified document that analyzes the potential capabilities of terrorist forces that might attack nuclear sites. The report also says some DOE nuclear sites will not be able to meet the new security standards for up to several years.

“In the past we had determined that someone would have to get in and out (of a nuclear facility to do damage), and now we’ve determined that all they have to do is get in.” — Robin Nazzaro, GAO, at a House Committee hearing (UPI, April 27, 2004).

“The people looking for soft spots would be ill-advised to come to the facilities for which I am responsible.” — Linton Brooks, Administrator of DOE’s National Nuclear Security Administration (UPI, April 27, 2004).

“Without question, DOE’s nuclear war-head production plants, test facilities,

research labs, storage locations and de-commissioned sites are attractive targets for terrorists determined to turn our technology against us and willing to die while doing so.” — Representative Christopher Shays of Connecticut. (Tri-City Herald, April 28, 2004).

- A U.S. Senate committee approves a bill asking the Interior Department to study whether Manhattan Project facilities – including Hanford – should become national parks. The study will not begin unless approved by the full Senate, House and the President.
- The U.S. Environmental Protection Agency and DOE reach tentative agreement on new deadlines for removing sludge from the K-Basins. The agreement comes in time for DOE to beat a May 1 deadline and avoid fines of up to half a million dollars. DOE had earlier missed a Tri-Party Agreement milestone to begin sludge removal by December 31, 2002. Under the new plan, the sludge would be containerized, beginning by October 2004. Complete removal of the K Basins and their contents is required by March 31, 2009.

May 2004

- In response to continuing concerns about worker exposure to hazardous fumes, air monitors are being installed at the vitrification plant construction site. The construction site is about a quarter mile from the nearest tank farm, although no problems had been reported at that specific farm.
- Annual cost estimates for the construction and testing of Hanford’s vitrification facilities have increased by \$60 million in the past year. The latest estimate of \$5.692 billion is still below the DOE approved budget of \$5.78 billion. Construction is pretty much on schedule, with about 25 percent of the construction work completed.
- The Senate Armed Services Committee adds a rider to the \$422 billion fiscal year 2005 Department of Defense authorization bill that allows DOE to reclassify high-level waste at South Carolina’s Savannah River Site, and leave it on-site. The language was added at the request of DOE, which has been seeking a legislative fix to a 2003 federal court ruling that said DOE’s internal policies for waste reclassification were inconsistent with the Nuclear Waste Policy Act. DOE has been aiming to get the waste reclassification authority for all of its sites, including Hanford, but opposition by Washington’s Senators and Governor resulted in the rider focusing only on Savannah River.
- A preliminary investigation by the state of Washington into vapor exposures to Hanford tank farm workers concludes that because much is still not known about the vapors, existing monitoring done for worker protection may not

May 2004 continued

be adequate. The investigation, conducted by several state agencies, also identified isolated problems with worker compensation claims.

- Hanford marks the 15th anniversary of the signing of the Tri-Party Agreement.

"At present, the (Department of) Labor & Industries does not have sufficient information to conclude that there is a systemic mishandling of workers compensation claims."
— Letter from Governor Gary Locke and Attorney General Christine Gregoire to Energy Secretary Spencer Abraham (May 7, 2004).



Aerial photo of the waste treatment complex in April 2004.

