Section 3

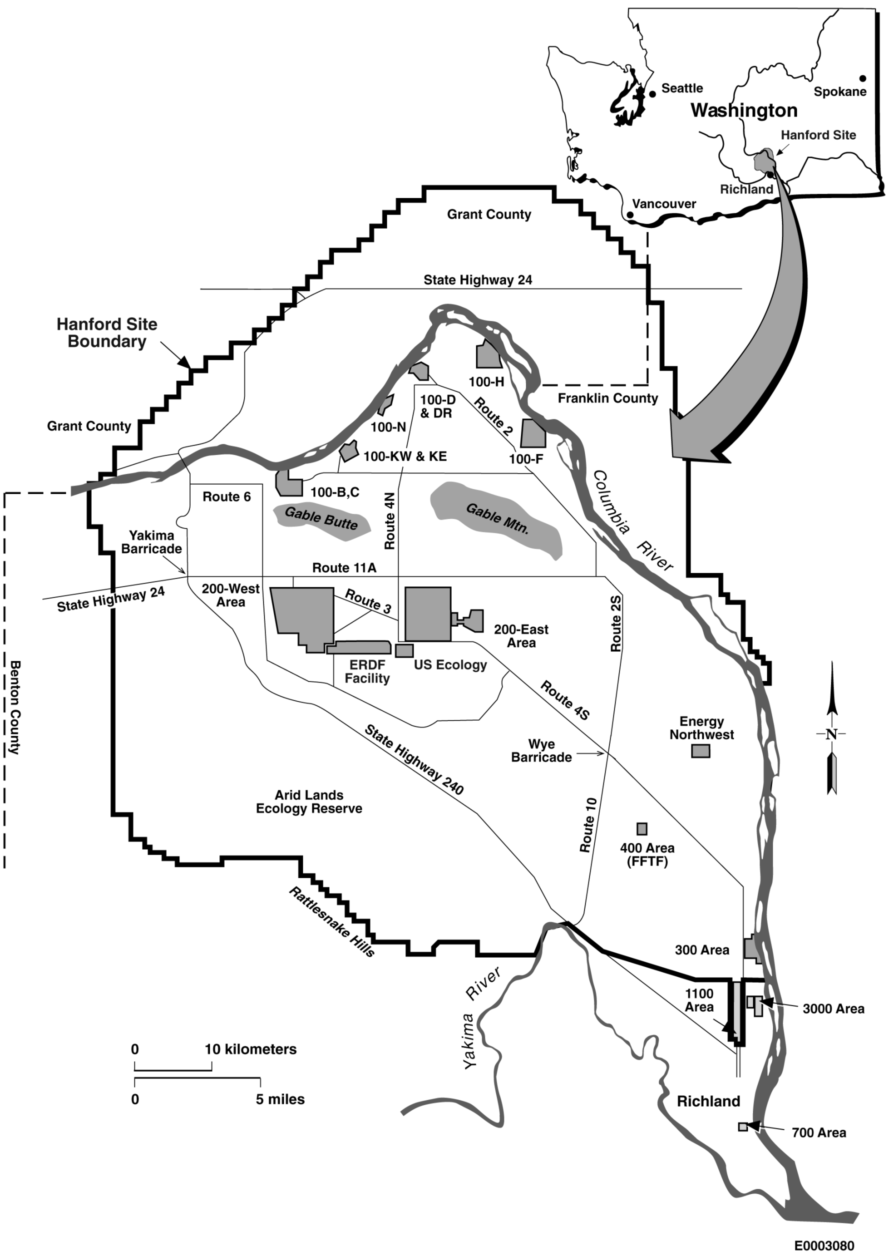
DESCRIPTION OF THE HANFORD SITE AND ACTIVITIES CARRIED OUT ON THE SITE

This section provides a general description of the Hanford Site, its activities and past practices. It is not a complete description of all that is known about the Hanford Site, its operations, or its waste management history. More recent data on environmental contamination and groundwater plumes may be found in several documents publicly available at the USDOE Public Reading Room in Richland, or by searching the Reading Room's catalog on the Internet at www.rrcatalog.pnl.gov.

SITE DESCRIPTION

Hanford is a 586-square mile site in southeastern Washington State, situated north and west of the cities of Richland, Kennewick, and Pasco, an area commonly known as the Tri-Cities. Hanford is approximately 140 miles southwest of Spokane, Washington; 200 miles southeast of Seattle, Washington; and 200 miles northeast of Portland, Oregon. (Refer to Hanford Site map.) The Columbia River runs through the northern portions of the Site, then turns south to form part of the eastern boundary.

The geologic structure beneath the Hanford Site consists of three distinct formations. The deepest level is a thick series of basalt flows that have been warped and folded, resulting in extensions that crop out as rock ridges in some places. Layers of silt, gravel, and sand form the middle level, known as the Ringold formation. The uppermost level is known as the Hanford formation and consists of gravel and sands deposited by catastrophic floods. Both confined and unconfined aquifers can be found beneath the Hanford Site. Confined aquifers consist of water-saturated, porous material confined by layers of basalt. Unconfined aquifers consist of water-saturated, porous material located above the first confining basalt layer. The depth of the water table ranges from 60 to 250 feet below ground surface.



Hanford Site

Semi-arid land with a sparse covering of cold desert shrubs and drought-resistant grasses dominates the Hanford Site landscape. Forty percent of the Site's annual 6.25 inches of rain occurs between November and January. The land surrounding the Hanford Site is used primarily for agriculture and livestock grazing. The major population center near the Site is the Tri-Cities, with a combined population of nearly 120,000. The southwest area of the Hanford Site, covering 120 square miles, is designated as the Fitzner-Eberhardt Arid Lands Ecology Reserve. The Arid Lands Ecology Reserve is managed for the USDOE by the U.S. Fish and Wildlife Service, part of the Department of the Interior, and is used for ecological research and preservation. The Site's Wahluke Slope area, also known as the North Slope, located across the Columbia River, is also managed for the USDOE as a wildlife refuge by the U.S. Fish and Wildlife Service. The Wahluke Slope and Arid Lands Ecology Reserve, which comprise 45 percent of the 586-square-mile Site, have been cleaned and removed from the EPA Superfund list. In 2000, President William Clinton created the Hanford Reach National Monument that encompasses a 0.25-mile corridor on each side of the Columbia River for a 51-mile stretch through the Hanford Site. 'The Hanford Reach National Monument is managed by the U.S. Fish and Wildlife Service and USDOE.

Non-USDOE facilities within Hanford Site boundaries include three nuclear plants owned by Energy Northwest, a public utility. The Columbia Generating Plant (formerly WNP-2) is the only nuclear power plant operating to make electricity. Construction was stopped on WNP-1 and WNP-4 during the 1980s, but in 2001 Congress funded a study to investigate the feasibility of completing WNP-1.

Another non-USDOE facility on the Hanford Site is a low-level radioactive waste disposal facility operated by US Ecology, a private firm licensed by Washington State.

Additionally, the Laser Interferometer Gravitational Observatory project, a joint endeavor of the California Institute of Technology, and the Massachusetts Institute of Technology, sponsored by the National Science Foundation, built on the Hanford Site in 1994. The Laser Interferometer Gravitational Observatory is an advanced scientific observatory, designed to team with similar projects in Louisiana and Italy, for detecting gravity waves. Findings are expected to aid in understanding the workings of the universe, including Einstein's theories of gravity. The Laser Interferometer Gravitational Observatory is not a USDOE project, but the Hanford Site location was selected because of its available space and seismic stability.

USDOE facilities are located throughout the Hanford Site and the city of Richland. The Site is divided into six administrative areas, known as the 100, 200, 300, 400, 600, and 1100 Areas. The first four areas contained most of the nuclear operations at the Hanford Site. The 100 Area includes nine deactivated nuclear production reactors along the northern stretch of the Columbia River. The 200 East and 200 West Areas, located in Hanford's Central Plateau, contain approximately 53 million gallons of high-level radioactive waste in aging underground tanks, and the principal nuclear chemical processing and waste management facilities. The 300 Area, approximately three miles north of the city of Richland, contains research and development laboratories and former reactor fuel manufacturing facilities. The Fast Flux Test Facility is located in the 400 Area, which lies about 9 miles northwest of the 300 Area. The 600 Area is the administrative designation for Site lands that are not part of any other administrative area. The 1100 Area, located adjacent to the Richland city limits, once contained vehicle maintenance and storage facilities. However, this 1.25-square mile area was cleaned up, removed from the Superfund list in 1995, and transferred to the Port of Benton (a local port district) to assist in economic diversification development in the North Richland area and is no longer a part of the Hanford Site.

HANFORD SITE HISTORY

The Hanford Site was originally inhabited by Native Americans, primarily the Wanapum Band. It was also used by the Yakama, Nez Perce, Umatilla, Walla Walla, and Cayuse Tribes. In 1855, the Yakama, Nez Perce, Umatilla, Cayuse and Walla Walla Tribes signed treaties with the United States under which the tribes ceded to the Federal government the lands on which the Hanford Site is located and other lands. The tribes reserved certain rights in the ceded lands: to take fish from all streams within or adjacent to the territory and at their usual and accustomed places, and to erect temporary buildings for curing fish. The tribes also reserved the privileges to hunt, to gather roots and berries, to graze their horses and cattle on open and unclaimed land, and to observe traditional religious practices at physical locations considered sacred.

Parts of the land, now the Hanford Site, were settled by non-Native Americans and used for irrigated orchards, farms, and ranches before World War II. Approximately 6,000 acres were used to grow peaches, pears, grapes, asparagus, and other agricultural products. The towns of Hanford, White Bluffs and Richland were founded by some of these non-Native Americans.

Hanford Site construction began in March 1943 after the Manhattan District of the Army Corps of Engineers chose it as one of the sites for the highly secret Manhattan Project. Hanford's mission was to produce plutonium for the world's first nuclear weapons. Hanford was considered to be an ideal site for the Manhattan Project for several reasons: 1) its remote location; 2) access to railroad systems; 3) the abundance of water from the Columbia River for cooling the reactors; and 4) the abundance of hydroelectric power from dams on the Columbia River. About 1,500 people who were living within the Site boundaries were forced to move.

In September 1944, with the first operation of B Reactor in the 100 Area, the Department of Defense (at that time known as the War Department) began producing materials to be used in nuclear weapons. B Reactor startup was followed by the startup of D Reactor in December 1944, and F Reactor in February 1945. These three reactors produced the initial plutonium for nuclear weapons.

By 1955, seven reactors similar in design to the original B Reactor were built and all eight reactors were in operation to produce plutonium at the Hanford Site. Between 1959 and 1963, a very powerful dual-purpose reactor, N Reactor, was constructed. In addition to producing plutonium, N Reactor steam was used to make electricity for domestic consumption. In 1966, the utility known then as the Washington Public Power Supply System (now Energy Northwest) built a power generating facility near the N Reactor to harness reactor steam to generate electricity.

In addition to the reactors, operations at the Hanford Site included other elements of the nuclear fuel cycle: fuel fabrication, chemical processing, waste management, and research and development facilities. Large amounts of radioactive substances were released to the air, ground, and water during early operations at the Hanford Site. The possible health consequences of these releases are being studied by programs outside the Tri-Party Agreement.

The development of Hanford's plutonium production capacity resulted in the growth of the area surrounding the Site. In the months following initial construction on the Site in 1943, more than 50,000 construction workers moved to the Hanford area. Many of these workers later settled in the Tri-Cities, which became not only the fourth largest metropolitan area in Washington State, but a new economic hub for the region.

Eight of the nine plutonium production reactors were closed between 1964 and 1971 when the nation's plutonium needs diminished due to a shift in national defense policy. As part of a national program to investigate peaceful uses of nuclear power and research, the Hanford Site was chosen as the location for the Fast Flux Test Facility advanced reactor in 1967.

In the early 1980s, Hanford Site activities shifted again to re-emphasize defense production. Site facilities were upgraded and used to produce material that was to be part of President Ronald Reagan's Strategic Defense Initiative (sometimes known as Star Wars).

Beginning in 1989, USDOE's primary mission at the Hanford Site shifted from production to waste cleanup. The Tri-Party Agreement was signed in May 1989, among the USDOE, EPA, and Ecology. No plutonium for defense purposes has been produced at the Hanford Site since that time.

SCIENCE AND TECHNOLOGY MISSION

The USDOE's Pacific Northwest National Laboratory (Pacific Northwest) is located just south of the Hanford Site. Pacific Northwest provides science and technology support for USDOE's science, environmental, quality, energy and national security mission.

Pacific Northwest staff members provide research and engineering design to develop new environmental technologies as well as support clients in making informed environmental decisions. They also advance fundamental knowledge in the biological, physical and information sciences; provide solutions that prevent proliferation of nuclear, chemical and biological weapons of mass destruction; and develop new technologies to assure the nation's energy security.

Battelle has operated Pacific Northwest for USDOE and its predecessors since 1965. A unique feature of Battelle's contract with the Department allows its staff to work for private industry.

PAST AND PRESENT OPERATIONS AT THE HANFORD SITE

USDOE activities at the Hanford Site now center around waste management, environmental restoration, and science and technology. Activities that have been or are presently conducted at the Hanford Site are described in the following sections, and are broken into Hanford's main operating areas.

100 AREA

The 100 Area consists of 26 square miles of land along the Columbia River where nine water-cooled plutonium reactors were constructed between 1943-1963 as part of the nation's defense program. There are six reactor areas in the 100 Area. Three of these areas contain two reactors each, and three contain just one reactor each. All nine reactors were operating at one time during the early1960s, but only N Reactor remained in operation after1971. N Reactor ceased operations in January 1987. The other eight reactors are B Reactor, 1944-1968; D Reactor, 1944-1967; F Reactor, 1945-1965; DR Reactor, 1950-1964; H Reactor, 1949-1965; C Reactor 1952-1969; KW Reactor, 1955-1970; and KE Reactor, 1955-1971. B Reactor is listed on the National Register of Historic Places and is being considered for preservation as a museum.

While in operation, the reactors disposed cooling water and solid wastes in the Columbia River and in more than 100 trenches, cribs (underground drain fields), ponds, and burial grounds in the 100 Area. Also, leaks in the reactors' wastewater piping and retention systems caused soil and underlying groundwater to be contaminated with chemical and radioactive pollutants.

The primary contaminants are the radioisotopes strontium-90, cobalt-60, cesium-137, tritium, and the heavy metal chromium. Solid waste burial grounds and other facilities not associated with liquid wastewater may also contain significant amounts of contaminants. These could pose human or environmental threats through exposure to ground and surface water contaminated by these substances. Some of the waste has reached groundwater, which ultimately flows into the Columbia River. The 100 Area has about 11 square miles of waste disposal locations and contaminated groundwater.

Hundreds of soil waste sites have been identified in the 100 Area, and contractors working for USDOE's Richland Operations Office began remediating them in the mid-1990s. Since then, over two million tons of contaminated soil have been excavated and taken to a lined, permitted, mixed waste landfill called the Environmental Restoration Disposal Facility in the center of the Hanford Site. The Environmental Restoration Disposal Facility lies more than 200 feet above the groundwater, and all of its rainwater and drainage water is collected and treated to remove contaminants before being discharged. Soil cleanup operations in the 100 Area are projected to last until at least 2012, and involve removing an estimated 10 million tons of waste from the 100 and 300 Areas. Final remediation of surface and near-surface sites will consist of placing clean fill dirt on the formerly contaminated areas, and re-vegetating with native plant species. Additionally, "pump-and-treat" systems are in use to reduce chromium levels and the levels of some other contaminants in 100 Area groundwater sites. The chromium cleanup actions will help protect salmon spawning areas in the Hanford Reach.

Contamination discharges from the 100 Area have stopped almost totally, although there is slow seepage of some contaminants to the Columbia River through underground springs and groundwater. Monitoring results show that concentrations of radionuclides identified in the river are within the drinking water standards set by the EPA and Washington State.

The 100 Area reactors are being remediated in the USDOE Interim Safe Storage program, known as "cocooning." Beginning in late 1996, all of the "wings" were torn off of the C Reactor building; hundreds of tons of asbestos, steel, copper, and contaminated soil were removed; and the old pumphouse, pumps, tunnels and other ancillary parts of the structure were razed. In total, approximately 80 percent of C Reactor was eliminated and buried in Hanford Site disposal facilities. Only the core and the surrounding shields were left. They were then sealed up, and given a new aluminum and zinc-coated steel roof slanted at a sharp angle to facilitate rain run-off and extended down over the top portions of the old shield walls for additional sealing. The entire C Reactor Interim Safe Storage Project was completed in October 1998. Presently, interim safe storage projects are underway at F, H, and DR Reactors, and similar projects are planned for at least three other Hanford production reactors. Costs decline at each location as crews learn their way through the maze of tunnels, levels, and service areas.

One of the major cleanup priorities in the 100 Area is the K Basins. More than 2,100 metric tons of spent nuclear fuel, nearly 80 percent of USDOE's nationwide inventory, is stored in concrete basins adjacent to the K West and K East reactors. Located a few hundred yards from the Columbia River, the 40-year-old basins do not meet current safety standards, and one has a history of serious leaks. After six years of planning, design, and construction, operations to remove the spent nuclear fuel from the basins began in December 2000. Operations are now fully underway and fuel removal is scheduled to be completed in mid-2004. Fuel is removed from the basin water in a large steel container called a Multi-Canister Overpack, taken to a new drying facility where the moisture is removed, and then sent to dry storage in steel tubes beneath a large building in the Hanford Site's Central Plateau.

200 AREA

Chemical processing, plutonium finishing, and defense waste management activities took place in the 200 East and 200 West Areas, located on the Central Plateau. Since 1944, nuclear fuel irradiated in Hanford's 100 Area production reactors was transported to the 200 Areas and chemically treated to remove and refine plutonium and uranium. The process involved dissolving the solid irradiated fuel elements, and then chemically separating constituents in order to separate plutonium and uranium from waste fission products. Then the plutonium constituent, mixed with nitric acid in a liquid plutonium nitrate form, was heated with some forming agents to produce solid metal plutonium shapes.

These processes produced radioactive, hazardous, and mixed (radioactive and hazardous) wastes, all of which have been stored or disposed in the 200 Areas. The 200 Areas contain 149 underground, single-shell storage tanks and 28 double-shell tanks with a capacity of up to 1 million gallons each. These tanks store more than 53 million gallons of high-level radioactive waste, the majority of which came from the radiochemical facilities. Up to 67 of the single-shell tanks are known or suspected to have leaked some of their contents into the soil. Between 1 and 2 million gallons of tank wastes are believed to have leaked, with some contaminants reaching groundwater. Congress created the Office of River Protection in 1998 to protect the Columbia River from the hazardous tank waste. The primary purpose of this USDOE field office is establishing the Hanford tank waste treatment complex. The mission of the Office of River Protection is to retrieve high-level tank waste, build and operate tank waste facilities, and to close tank farms.

Wastes from the plutonium finishing operations were more varied, and generally smaller in volume. Sludges, powders, shavings, aerosols, liquids, and solids were generated as wastes from these operations. Many of the liquid wastes were disposed in the soil south of the Plutonium Finishing Plant in the 200 West Area, and stored in tanks after 1973. Various plutonium materials and wastes remain in the Plutonium Finishing Plant and are undergoing stabilization and cleanout today.

Solid radioactive and mixed wastes were disposed over the years by burial in trenches and in two large structural tunnels at the Hanford Site. The two tunnels extend just south of the Plutonium-Uranium Extraction plant in the 200 East Area, and were used to dispose of very large items. In 1970, Hanford Site policy changed to mandate that all solid waste disposals had to occur in the northwest quadrant of the 200 West Area, and that wastes and locations had to be labeled to record their contents and radioactivity levels. Today, solid wastes known to contain transuranic elements are being excavated for shipment to the Waste Isolation Pilot Project in New Mexico for permanent disposal. Transuranic elements are those higher, or heavier, than uranium on the Periodic Table of the Elements. These elements include plutonium, neptunium, and americium. Low-level solid wastes will remain buried at the Hanford Site in perpetuity.

Over the years, low-level liquid wastes from 200 and 300 Area facilities were discharged to Site soils through various trenches, drains, cribs, and, in a few cases, reverse wells (also known as injection wells). A total of about 440 billion gallons were so disposed to Site soils (not counting reactor cooling water that went to the Columbia River). The practice of discharging untreated liquid wastes to Hanford Site soils ended in 1995, when the Liquid Effluent Retention Facility began operations. The facility, along with two Treated Effluent Disposal Facilities built onsite in the early 1990s, treats all contaminated discharges to remove radioactivity before liquids are discharged to the soil.

Groundwater samples taken over the years in the 200 Areas have revealed concentrations of many radioisotopes, including tritium (a radioactive isotope of hydrogen), uranium, strontium-90, cesium-137, iodine-129, and others. Chemicals including cyanide, carbon tetrachloride and others also are present in 200 Area groundwater. Cyanide is an organic compound that was used during uranium recovery, and carbon tetrachloride is a solvent that was used in the plutonium extraction process in the Plutonium Finishing Plant. Contaminants spread out in groundwater from the point of disposal into large fans known as plumes. Spreading from Hanford's 200 Areas, the tritium plume is the largest and extends east to the Columbia River. In total, the 200 Areas contain 230 known liquid disposal locations that generated 215 square miles of contaminated plumes.

In the early 1990s, a large project began to remove carbon tetrachloride from soils in the vicinity of the Plutonium Finishing Plant using a vapor extraction method. Thus far, about 20 percent of the approximately 900,000 pounds of the chemical has been extracted from 200 West Area soils. A large pump-and-treat effort is underway for contaminated groundwater below the historical U Pond site in the 200 West Area. In total, over 300 million gallons of contaminated groundwater have been pumped out, treated, and released as clean water at the Hanford Site thus far. In 1998, Hanford's newest major project was created, the Groundwater/Vadose Zone Integration Project, to examine all aspects of subsurface, non-solid contamination in an integrated fashion. The vadose zone is that area between the surface of the soil and the groundwater.

The following large facilities operated over the years in the 200 Areas.

B Plant and T Plant

Processing of the Hanford Site's reactor fuel from 1944 through 1956 was conducted at B Plant in the 200 East Area and T Plant in the 200 West Area. Since 1957, T Plant has been used as a decontamination facility for Site equipment. T Plant is now the oldest nuclear facility in the world that still has a nuclear mission. Today, T Plant is being readied to store the contaminated sludge that will come out of the spent nuclear fuel basins at the Hanford Site.

From 1968 through 1984, B Plant was used to remove high heat-producing isotopes of cesium and strontium from the liquid waste in storage tanks. The Waste Encapsulation and Storage Facility was added to the B Plant complex in 1974 to encapsulate and store the cesium and strontium. B Plant was deactivated in a project that was completed in 1998. During that project, the Waste Encapsulation and Storage Facility was "de-coupled" from B Plant, so that it can continue to store the nearly 2,000 capsules until final disposal decisions are made. As of now, schedules call for the contents of the capsules to be vitrified in Hanford's vitrification facility beginning in 2018.

Reduction Oxidation Plant and Plutonium-Uranium Extraction Plant

In the 1950s, two new radiochemical processes were invented at the Hanford Site. Chemical processing was conducted at the Reduction Oxidation Plant in the 200 West Area from 1952 through 1967, and at the Plutonium-Uranium Extraction plant in 200 East Area. The Plutonium-Uranium Extraction plant opened in 1956, went into standby in 1972, was re-started in 1983, and was shut down in 1988. A large deactivation project, which became a model in the USDOE complex, was conducted from 1993-1997. As a result, facility surveillance costs declined dramatically and the plant remains passive until final disposition decisions are made.

Uranium Oxide Plant

Once plutonium and uranium were separated from irradiated fuel, they were sent to other Hanford Site facilities for further processing. Liquid material containing uranium went to the Uranium Oxide Plant in the 200 West Area, where it was converted into a solid powder (oxide) and sent offsite for recycling. The Uranium Oxide Plant was deactivated and placed on long-term surveillance and maintenance status in 1994.

Plutonium Finishing Plant

The Plutonium Finish Plant was built in 1949 to process plutonium for use in nuclear weapons. During the Cold War, the Plutonium Finish Plant was the final link in the Hanford Site plutonium production activities. There, plutonium nitrate solutions were purified and converted into solid plutonium metal for shipment to government weapons facilities until 1989. In 1996, the Plutonium Finish Plant received its shutdown order from USDOE Headquarters. An explosion at the Plutonium Finish Plant the following year heightened concerns about conditions at the plant and underscored the urgent need to cleanup and dismantle the facility. About 4 metric tons of plutonium in about 17 metric tons of bulk plutonium-bearing materials remains at the plant in a variety of forms such as metals, oxides, liquids, polycubes, and residues. Currently, the main focus at the Plutonium Finish Plant is to safely stabilize and repackage the plutonium, and to conduct planning for the deactivation and dismantling. The current USDOE baseline activities and schedule for Plutonium Finish Plant transition are 1) stabilize and/or repackage nuclear materials to be performed by fiscal year (FY) 2004, 2) deactivate and dismantle process support facilities beginning FY 2002 and ending FY 2016, and 3) surveillance and maintenance phase beginning FY 2017.

200 Area Laboratories

The 222-S Laboratory in the 200 West Area was built during 1950-1951, but was upgraded and modernized in the early 1990s. Today it performs sampling analyses for the Site's waste tanks program, and other Site programs. The Waste Characterization and Sampling Facility, located just east of the 200 West Area, is a much newer laboratory complex built during the 1990s that processes hazardous samples and samples containing low levels of radioactivity. It also manages a mobile sampling vehicle that serves some remote onsite locations.

Environmental Restoration Disposal Facility

The Environmental Restoration Disposal Facility is the primary repository for low-level/mixed contaminated soils and contaminated structure rubble from cleanup projects on the Hanford Site. The Environmental Restoration Disposal Facility opened in 1996, and by 2001 it had received over 2 million tons of such nuclear debris. About 3,000 tons of waste, contained in about 150 truckloads, enter the Environmental Restoration Disposal Facility on a typical day. The total amount of waste and debris deposited in the Environmental Restoration Disposal Facility is expected to be at least 10 million tons as cleanup progresses.

300 AREA

Facilities in the 300 Area have been used since World War II for fabrication of reactor fuel, research and development, and technical and service support functions. Some limited research and development on radioactive materials still takes place in the 300 Area, but most of the old laboratories are being deactivated. Fuel fabrication buildings, and structures associated with irradiation experiments, either have been deactivated or are now being deactivated. Deactivation activities are governed by Tri-Party Agreement milestones. Eventual demolition of most of the 300 Area buildings is planned.

Liquid and solid wastes from operations in the 300 Area were disposed of in various ponds, trenches, and burial grounds over approximately a 5-square mile area. The primary contaminants of these sites include uranium, metal shavings and dusts, acids, and solvents used in fuel fabrication operations.

400 AREA

The 400 Area is the location of the Fast Flux Test Facility, a liquid metal test reactor that began full-power operation in 1982 and shut down in 1993. Initially, the Fast Flux Test Facility served as a test tool for advanced reactor technology, but it then expanded into other areas of research and development, including fusion research, space power systems, medical isotope production, and international research programs. During its standby period, the Fast Flux Test Facility was considered as a possible producer of tritium and medical isotopes for the United States. However, after seven years in standby status, the Fast Flux Test Facility was ordered to permanent deactivation and closure in late 2000. In early 2001, at the request of the Hanford Site's Congressman, USDOE authorized another study of Fast Flux Test Facility's future viability as a facility to produce medical isotopes. However, the USDOE announced in December 2001 that the reactor will be shutdown and the Department will proceed with facility deactivation.

600 AREA

The 600 Area encompasses Hanford's roads, railroads, fire station, an old concrete batch plant site, contaminated storage vaults in the east end of Gable Mountain, the former town sites of Hanford and White Bluffs, the Hanford meteorology station, the Wahluke Slope, and the Arid Lands Ecology Reserve (including Rattlesnake Mountain). There is little contamination in the 600 Area, except in groundwater beneath large stretches.

1100 AREA

Cleanup of the 1100 Area was completed in 1995, and it became the first Hanford area to be removed from the National Priorities List (created by the *Comprehensive Environmental Response, Compensation and Liability Act of 1980*). It had no disposal locations for radioactive or mixed wastes, but contained several sites at which hazardous wastes were disposed. These wastes included batteries and battery acid containing lead and sulfuric acid, and ethylene glycol (antifreeze). After cleanup, USDOE transferred the 1100 Area to the Port of Benton in Richland to assist in local economic diversification. The Port of Benton created a Manufacturing Mall, and has attracted several private businesses.