

1.0 Introduction



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This report, published annually since 1958, includes information and summary analytical data that (1) provide an overview of U.S. Department of Energy (DOE) activities at the Hanford Site during calendar year 2004; (2) demonstrate the site's compliance with applicable federal, state, and local environmental laws and regulations, executive orders, and DOE policies and directives; (3) characterize Hanford Site environmental management performance; and (4) highlight significant environmental, public, and worker protection programs.

Specifically, this report provides a short introduction to the Hanford Site, discusses the site mission, and briefly highlights the site's various environmental-related programs. Included are sections discussing site compliance with local, state, and federal environmental laws and regulations; site operations including environmental restoration efforts and cleanup and closure activities; environmental occurrences; effluent and emissions from site facilities; the results of onsite and offsite environmental and groundwater monitoring efforts; and cultural and biological resource assessments.

Readers interested in more detail than that provided in this report should consult the technical documents cited in the text and listed in Section 9.0. Descriptions of specific analytical and sampling methods used in the monitoring efforts are contained in the *Environmental Monitoring Plan, United States Department of Energy Richland Operations Office* (DOE/RL-91-50).

1.0.1 Current Site Mission

The missions of DOE at Hanford are to safely clean up and manage the site's legacy waste, and to develop and deploy technology. The Hanford Site's primary mission is accelerating the completion of waste cleanup. The report *Performance Management Plan for the Accelerated Cleanup*

of the Hanford Site (DOE/RL-2002-47) states that the cleanup mission includes six strategies:

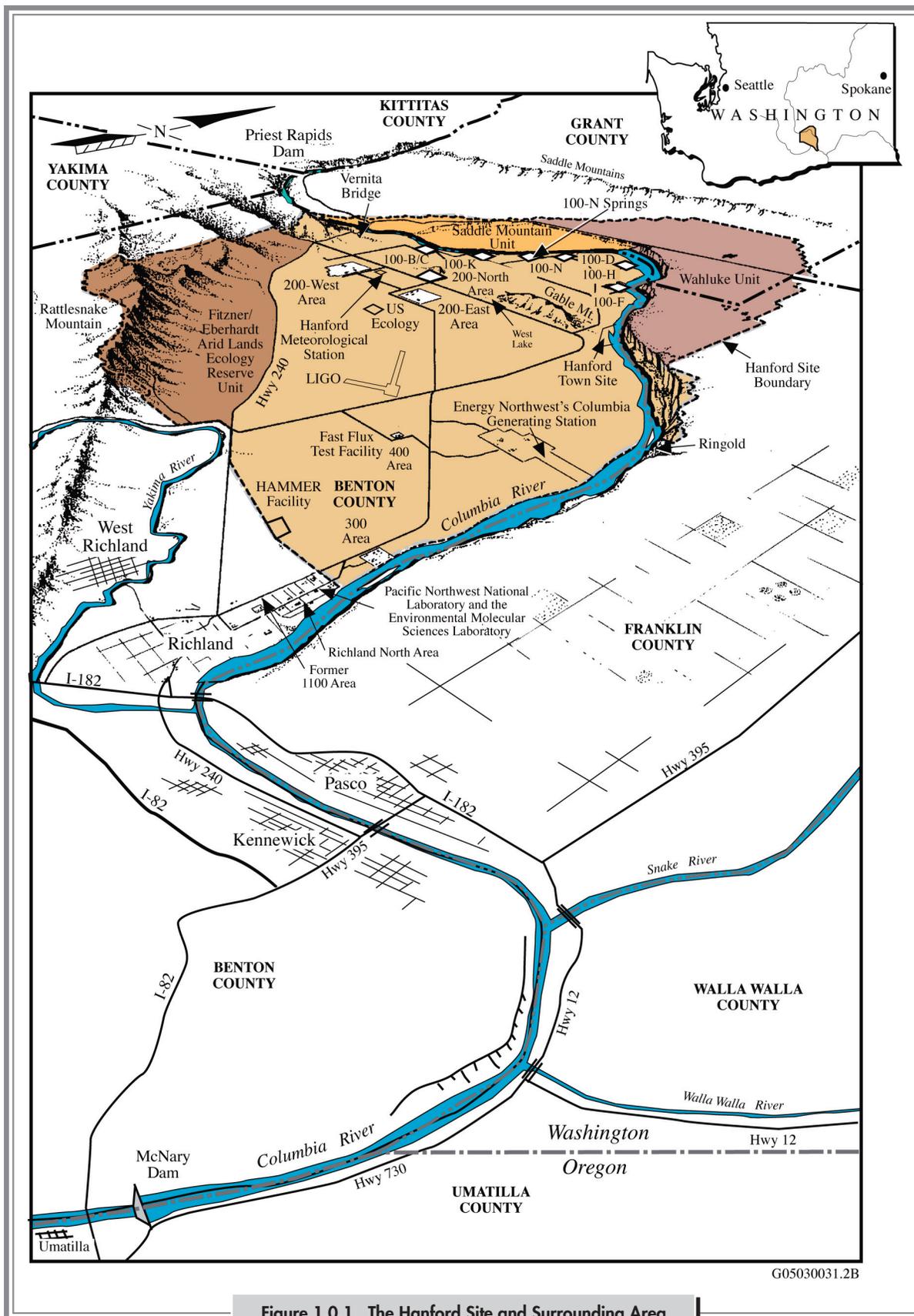
1. Restoring the Columbia River corridor by accelerating cleanup of Hanford Site sources of radiological and chemical contamination that threaten the air, groundwater, or Columbia River. It is expected that most river corridor projects will be completed by 2012.
2. Ending the tank waste program by 2033 by accelerating waste retrieval, increasing the capacity of the Waste Treatment Plant (currently under construction), and starting the process of closing the underground waste storage tanks.
3. Accelerating the cleanup of other Hanford facilities that are considered urgent risks.
4. Accelerating treatment and disposal of mixed low-level waste, and the retrieval of transuranic waste and its shipment off the site.
5. Accelerating cleanup of excess facilities on the Central Plateau.
6. Accelerating cleanup and protection of groundwater beneath the Hanford Site.

The goal of these strategies is to accelerate the completion of site cleanup, excluding underground waste storage tanks, from 2070 to 2035, and possibly as soon as 2025, and to do so in a cost-effective manner that protects public and worker health and safety and the environment.

1.0.2 Overview of the Hanford Site

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeastern Washington State (Figure 1.0.1). The site occupies an area of approximately 1,517 square kilometers (586 square miles) located north





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Figure 1.0.1. The Hanford Site and Surrounding Area

of the city of Richland (DOE/EIS-0222-F). This area has restricted public access and provides a buffer for areas on the site that were used for production of nuclear materials, waste storage, and waste disposal. The Columbia River flows eastward through the northern part of the site and then turns south, forming part of the eastern site boundary.

The major DOE operational, administrative, and research areas on and around the Hanford Site (Figure 1.0.1) include the following locations:

- **100 Areas** – located along the south and west shores of the Columbia River. These are the sites of nine retired plutonium production reactors. The 100 Areas occupy a total of approximately 11 square kilometers (4 square miles).
- **200-West and 200-East Areas** – centrally located on a plateau. These areas are approximately 8 and 11 kilometers (5 and 7 miles), respectively, south and west of the Columbia River. These areas contain underground waste storage tanks and house facilities that received and dissolved irradiated fuel and then separated out the plutonium. The facilities were called “separations plants.” The 200-East and 200-West Areas cover a total of approximately 16 square kilometers (6 square miles).
- **300 Area** – located just north of Richland, Washington. From the early 1940s until the advent of the cleanup mission, most research and development activities at the Hanford Site were carried out in the 300 Area. The 300 Area was also the location of nuclear fuel fabrication. This area covers approximately 1.5 square kilometers (0.6 square mile).
- **400 Area** – located northwest of the 300 Area. The 400 Area is the location of the Fast Flux Test Facility, which was being deactivated and decommissioned during 2004. This nuclear reactor was designed to test various types of nuclear fuel. The 400 Area covers approximately 0.61 square kilometer (0.23 square mile).
- **600 Area** – includes all of the Hanford Site not occupied by the 100, 200, 300, and 400 Areas. This area includes most of the Hanford Reach National Monument. The portion of the Hanford Reach National Monument administered by the DOE Richland Operations Office included the McGee Ranch/Riverlands Unit (north and west of State Highway 24 and south of the

Columbia River), and the Columbia River Corridor Unit, including the Hanford Reach islands in Benton County and a 0.4-kilometer- (0.25-mile-) wide strip of land along the Benton County side of the Hanford Reach shoreline from the Vernita Bridge to just north of the 300 Area. This unit also includes the Hanford dunes area north of Energy Northwest (Figure 1.0.2).

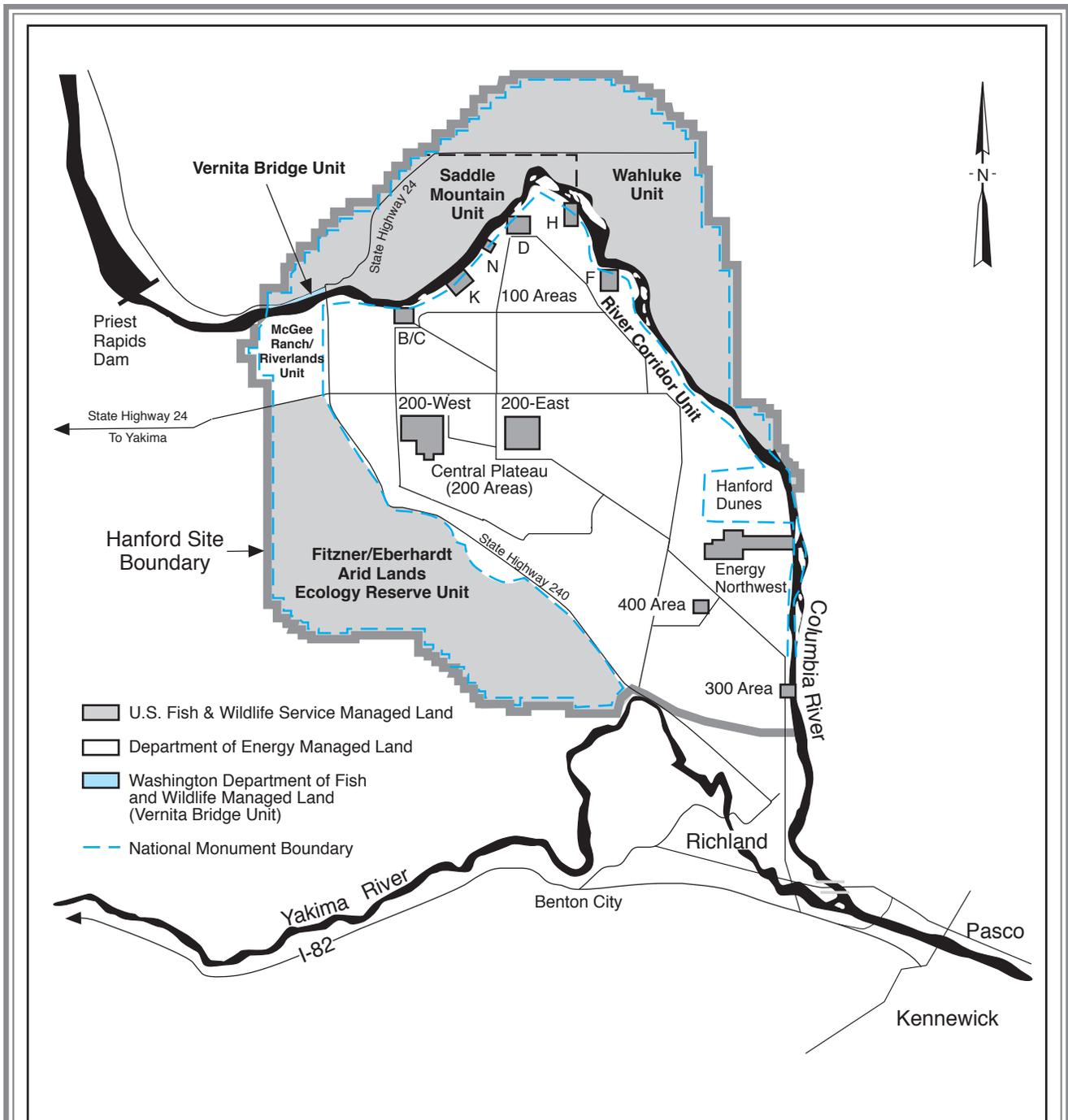
- **Former 1100 Area** – located between the 300 Area and the city of Richland covering an area of 311 hectares (768 acres). On October 1, 1998, this area was transferred to the Port of Benton as a part of DOE’s Richland Operations Office economic diversification efforts and is no longer part of the Hanford Site. However, DOE contractors continue to lease facilities in this area.
- **Richland North Area (off the site)** – includes the Environmental Molecular Sciences Laboratory, the Pacific Northwest National Laboratory, and other DOE and contractor facilities, mostly office buildings, generally located in the northern part of the city of Richland.
- **700 Area (off the site)** – an area of DOE administrative buildings in central Richland.
- **Volpentest Hazardous Materials Management and Emergency Response Training and Education Center (also called HAMMER)** – a worker safety-training facility located on the site near the city of Richland. It consists of a 32-hectare (80-acre) main site and a 4,000-hectare (10,000-acre) law enforcement and security training site. The facility is owned by DOE, managed by Fluor Hanford, Inc., and is used by site contractors, federal and state agencies, tribal governments, and private industry.

Other site-related facilities (office buildings) are located within Richland, Pasco, and Kennewick (the Tri-Cities).

The 78,900-hectare (195,000-acre) Hanford Reach National Monument (Figure 1.0.2) was established on the Hanford Site by a Presidential Proclamation in June 2000 (65 FR 114) to protect the nation’s only non-impounded stretch of the Columbia River upstream of Bonneville Dam in the United States, and a remnant of the shrub-steppe ecosystem that once blanketed the Columbia River Basin.

Non-DOE operations and activities on Hanford Site leased land include commercial power production by





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Figure 1.0.2. Management Units on the Hanford Reach National Monument (Monument boundaries are approximate.)

Energy Northwest at the Columbia Generating Station (4.4 square kilometers [1.6 square miles]) and operation of a commercial low-level radioactive waste burial site by US Ecology, Inc. (0.4 square kilometer [0.2 square mile]). The Laser Interferometer Gravitational Wave Observatory (LIGO) was constructed between 1994 and 1999 and is operated jointly by the California and Massachusetts Institutes of Technology and sponsored by the National Science Foundation.

Near the city of Richland, immediately adjacent to the southern boundary of the Hanford Site, AREVA operates a commercial nuclear fuel fabrication facility, and Pacific EcoSolutions operates a low-level radioactive waste decontamination, super compaction, and packaging facility.

1.0.3 Site Management

DOE's Richland Operations Office and Office of River Protection jointly manage the Hanford Site through several contractors and their subcontractors. Each contractor is responsible for safe, environmentally sound, maintenance and management of its activities or facilities; for waste management; and for monitoring any potential effluent to assure environmental regulatory compliance. DOE, the U.S. Fish and Wildlife Service, and the Washington Department of Fish and Wildlife each manage portions of the Hanford Reach National Monument.

The DOE Office of Science. The Pacific Northwest Site Office of the DOE Office of Science oversees Pacific Northwest National Laboratory to support DOE's Science and Technology programs, goals, and objectives. Pacific Northwest National Laboratory is a DOE facility operated by Battelle Memorial Institute for DOE's national security and energy missions. The core mission is to deliver environmental science and technology in the service of the nation and humanity.

The DOE Richland Operations Office. The DOE Richland Operations Office serves as landlord of the Hanford Site and manages legacy cleanup, research, and other programs. During 2004, the principal contractors for the DOE Richland Operations Office, and their respective responsibilities, included the following:

- Bechtel Hanford, Inc. was the environmental restoration contractor for the Hanford Site during 2004.

Bechtel Hanford, Inc., a subsidiary of Bechtel National, Inc., planned, managed, and executed activities for the cleanup of contaminated soil and inactive nuclear facilities, with a major focus of protecting the Columbia River. Bechtel Hanford, Inc.'s subcontractors in 2004 were CH2M HILL Hanford, Inc. and Eberline Services Hanford, Inc. Washington Closure Company, LLC, was awarded the River Corridor Closure Contract in April 2003. This team of companies consisting of Washington Group International, Inc.; Fluor Federal Services; and Earth Tech, LLC, would have replaced Bechtel Hanford, Inc. and the personnel from Fluor Hanford, Inc. doing 300 Area decontamination and decommissioning work. A protest over the contract award was filed by Bechtel National, Inc. in May 2003, and this halted the transition of work to the Washington Closure Company. The protest was successful and in March 2005, Washington Closure (a limited liability corporation owned by Washington Group International [the lead contractor]; Bechtel National, Inc.; and CH2M HILL Hanford Group, Inc.) was chosen as the new River Corridor Closure contractor. Principal subcontractors will be Eberline Services and Integrated Logistics Services. This contractor selection was immediately protested by Fluor Hanford, Inc., but the protest was withdrawn in late May 2005. Work on the 7-year, \$1.9-billion contract began in early June 2005.

- Fluor Hanford, Inc. is the primary management contractor for Project Hanford. It manages and integrates work to support cleanup of former DOE nuclear production facilities at the site. In 2004, Fluor Hanford, Inc.'s principal subcontractors were Framatome ANP DE&S, Inc.; Duratek Federal Services of Hanford, Inc.; Numatec Hanford Corporation; and Westinghouse Safety Management Solutions. Other subcontractors to Fluor Hanford, Inc. included Day & Zimmerman Protection Technology Hanford, Lockheed Martin Information Technology, and Fluor Government Group.
- AdvanceMed Hanford was the occupational health contractor on the site in 2004. The company provided occupational medicine and nursing; medical surveillance and evaluations; ergonomics assessment; exercise physiology; case management; psychology counseling and evaluations; fitness-for-duty evaluations;



health education; infection control; immediate health care; industrial hygiene; and health, safety, and risk assessment.

The DOE Office of River Protection. The DOE Office of River Protection was established by Congress in 1998 as a field office to manage Hanford tank-waste retrieval, treatment, and disposal. The principal contractors for the DOE Office of River Protection in 2004 and their respective responsibilities included the following:

- Bechtel National, Inc. – Bechtel National, Inc.’s contract mission is to design and build facilities (the Waste Treatment Plant) on a 26.3-hectare (65-acre) site on the Central Plateau of Hanford to convert liquid radioactive waste into a stable glass form (vitrification). The 10-year contract for this work was awarded in December 2000.
- Washington Group International – A subcontractor to Bechtel National, Inc., Washington Group International is a participant in the mission to design and construct the Waste Treatment Plant.
- CH2M HILL Hanford Group, Inc. – This contractor has the responsibility to retrieve and store for treatment about 201 million liters (53 million gallons) of radioactive and chemically hazardous waste stored in 177 underground tanks at Hanford. The company’s role also includes storing the treated waste until permanent disposal facilities are available. The contract for CH2M HILL Hanford Group, Inc. runs through fiscal year 2006.

U.S. Fish and Wildlife Service. During 2004, the U.S. Fish and Wildlife Service administered three major management units of the Hanford Reach National Monument totaling about 668 square kilometers (258 square miles). These included (1) the Fitzner/Eberhardt Arid Lands Ecology Reserve Unit, a 312-square-kilometer (120-square-mile) tract of land with no public access in the southwestern portion of the Hanford Site; (2) the Saddle Mountain Unit, a 130-square-kilometer (50-square-mile) tract of land with no public access located north-northwest of the Columbia River and generally south and east of State Highway 24; and (3) the Wahluke Unit, a 225-square-kilometer (87-square-mile) tract of land located north and east of both the Columbia River and the Saddle Mountain Unit (Figure 1.0.2). All of these lands have served as a safety and security buffer zone for Hanford Site operations since 1943, resulting in an ecosystem that has been relatively untouched for nearly 60 years.

Washington Department of Fish and Wildlife – The Washington Department of Fish and Wildlife managed the Vernita Bridge Unit of the Hanford Reach National Monument, approximately 162 hectares (400 acres) along the north side of the Columbia River, west of the Vernita Bridge, and south of State Highway 243.

Additional information about Hanford Site management and contractors can be found on the Internet at <http://www.hanford.gov/?page=78&parent=15>.