

2.2 Compliance Status

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This section summarizes the activities conducted to ensure that the Hanford Site is in compliance with federal environmental protection statutes and related state and local environmental protection regulations. Also discussed is the status of compliance with these requirements. Environmental permits required under the environmental protection regulations are discussed under the applicable statute.

2.2.1 Hanford Federal Facility Agreement and Consent Order, 1997 Performance

This agreement (also known as the Tri-Party Agreement; Ecology et al. 1989) was signed on May 15, 1989 by the Washington State Department of Ecology, EPA, and DOE. The agreement is a legally enforceable document that establishes a schedule and framework for the cleanup of the Hanford Site. Specifically, the agreement commits DOE to achieve compliance with the Comprehensive Environmental Response, Compensation, and Liability Act remedial action provisions and with the Resource Conservation and Recovery Act treatment, storage, and disposal unit regulations and corrective action provisions including the state's implementing regulations.

From 1989 through 1997, a total of 562 enforceable milestones and 237 unenforceable target dates were completed on or ahead of schedule. Two enforceable milestones were missed and five were completed later than scheduled.

In 1997, there were 59 specific cleanup milestones and target dates scheduled for completion. All of these commitments were completed on or before their required due dates except for two, which were delayed because of safety issues.

Highlights of the work accomplished in 1997 are listed in Section 2.3, "Activities, Accomplishments, and Issues."

2.2.2 Environmental Management Systems Development

The International Organization for Standardization was founded in 1947 and promotes the development of international manufacturing, trade, and communication standards. In 1996, the organization issued an international voluntary consensus standard ISO 14001, *Environmental Management Systems – Specifications with Guidance for Use*. This industry-driven standard represents the culmination of international environmental standardization efforts spanning nearly two decades.

The ISO 14000-series of standards (Cascio 1996) are based on the following five guiding principles:

- An organization should define its environmental policy and ensure commitment to its environmental management system.
- An organization should formulate a plan to fulfill its environmental policy.
- For effective implementation, an organization should develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives, and targets.
- An organization should measure, monitor, and evaluate its environmental performance.
- An organization should review and continually improve its environmental management system, with the objective of improving its overall environmental performance.

The basis for any environmental management system is compliance with applicable environmental laws, regulations, permits, and other requirements. An effective system

goes beyond compliance and provides an organization with a systematic approach to the development, implementation, and maintenance of an environmental policy. The precept is that through planning, implementation, checking, management review, and continuous improvement, organizations become more effective and efficient in the management of their activities and the impacts of those activities on the environment.

On October 1, 1996, Fluor Daniel Hanford, Inc., the new site management and integration contractor, signed a letter of commitment to support the DOE Richland Operations Office request that it develop an environmental management system at the Hanford Site. This system is to be consistent with the principles of the ISO 14000-series of standards. The *Environmental Management System Implementation Plan* was completed in June 1997 (HNF-EP-925). At that time, a decision was made to include ISO 14001 in developing an integrated safety management system. During development, the name of the management system was changed to integrated environment, safety, and health management system.

The *Integrated Environment, Safety and Health Management System Plan* (HNF-MP-003) establishes a single, defined safety and environmental management system that integrates environment, safety, and health requirements into the work planning and execution processes to effectively protect the workers, public, and the environment. That plan specifically addresses the Project Hanford Management and Integration Contract requirements for a safety and environmental management system that satisfies Defense Nuclear Facilities Safety Board Recommendation 95-2, addresses implementation of an environmental management system consistent with the principles of the ISO 14001 standard, and supports radiological control considerations. The Fluor Daniel Hanford, Inc. integrated environment, safety, and health management system is primarily based on the philosophies, principles, and requirements of DOE's *Safety Management System Policy* (DOE P 450.4) and the ISO 14001 standard and also incorporates the best practices of the following policies, standards, and initiatives: Voluntary Protection Program, Responsible Care® of the Chemical Manufacturer's Association; and Enhanced Work Planning/Hanford Occupational Health Process.

Five safety management core functions defined in DOE P 450.4 provide the necessary planning, checks, and controls for any work that could potentially affect the workers, public, or the environment. An environmental management system is defined in the ISO 14001 standard as "the

part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy."

The Fluor Daniel Hanford, Inc. integrated environment, safety, and health management system consists of seven core functions that capture both DOE P 450.4 and ISO 14001 elements:

- establish environment safety and health policy
- define scope of work
- identify hazards and requirements
- analyze hazards and implement controls
- perform work within controls
- provide feedback and process improvement
- perform management review.

A deliberate, careful comparison and integration of DOE P 450.4 and the ISO 14001 standard resulted in the development of the guiding principles and core functions identified in HNF-MP-003. These guiding principles and core functions are the cornerstones for development of the Fluor Daniel Hanford, Inc. integrated environment, safety, and health management system. Provided in HNF-MP-003 is an appendix that cross references the elements of ISO 14001 and the guiding principles and core functions. A person familiar with ISO 14001 can use this table as a cross-reference to identify sections that correlate to ISO 14001 standard elements.

The final plan was issued in September 1997. Plans for implementing the system at Fluor Daniel Hanford, Inc.-managed facilities are scheduled to be completed by September 1998 for most facilities and earlier for priority facilities.

2.2.2.1 Chemical Management System

The Hanford Site, with its numerous contractors, facilities, and processes uses a variety of approaches for chemical management. In an effort to develop a uniform set of requirements for managing chemicals on the Hanford Site, the prime contractors initiated a coordinated effort to create a joint plan of action for chemical management on the Hanford Site. A multicontractor chemical management system working group was formed, and a strategy for chemical management was developed.

As part of the strategy, the prime contractors developed chemical management system requirements for the Hanford Site. The requirements were approved by the prime contractors on November 25, 1997, and transmitted to DOE Richland Operations Office. These requirements are applicable within the Hanford Site to the acquisition, use, storage, transportation, and final disposition of chemicals, including hazardous chemicals as defined in the Occupational Safety and Health Administration's hazard communication standard (29 CFR 1910.1200, Appendixes A and B).

The prime contractors will use these requirements to evaluate the adequacy of their chemical management programs, identify opportunities for improvement, implement changes as appropriate, and drive the day-to-day management of chemicals. It is recognized, based on the complexity of chemical management operations and the nature and severity of associated hazards, that these chemical management system requirements will be applied using a graded approach.

Each of the prime contractors will do the following as part of the strategy for implementation of the chemical management system requirements:

- conduct a gap analysis of the existing chemical management practices against the chemical management system requirements
- review analysis of the gaps identified and translate into needs
- write an implementation plan to meet the needs
- implement the plan.

Implementation of the chemical management system requirements by the prime contractors will provide coordinated, consistent chemical management on the Hanford Site. In addition, it will provide an architecture for protection of human health and the environment. The chemical management system requirements incorporate best industry practices, drive continuous improvement, and will be incorporated into the integrated environmental, safety, and health management system of the prime contractors.

2.2.3 Comprehensive Environmental Response, Compensation, and Liability Act

2.2.3.1 Environmental Restoration Disposal Facility

The Environmental Restoration Disposal Facility opened in July 1996. The 918,000-m³ (1.2-million-yd³) earthen facility is located near the 200-West Area (see Figure 1.0.2) and is constructed with double liners and a leachate collection system. The facility serves as a central disposal site for contaminated waste removed during cleanup operations conducted under Comprehensive Environmental Response, Compensation, and Liability Act authority on the Hanford Site. The cleanup waste may include soil, rubble, or other materials (excluding liquids) contaminated with hazardous, low-level radioactive, or mixed (combined hazardous chemical and radioactive) wastes.

In 1997, the facility received 539,000 metric tons (594,000 tons) of contaminated soil and other waste from various locations on the Hanford Site. Since inception, it has received 627,000 metric tons (691,000 tons) of contaminated soil and other waste from various Hanford Site locations. After 1 year in operation, the facility's first two cells are half full. Plans are currently under way for the expansion of the facility to meet future disposal needs.

2.2.3.2 Waste Site Remediation Projects

Full-scale remediation of waste sites began in the 100 Areas in 1996, with remediation of liquid waste disposal sites in the 100-B,C and 100-D Areas continuing in 1997. The remediation project in the 300-FF-1 Operable Unit began operation at former solid and liquid waste sites in the 300 Area in 1997. Historically, both chemical and radiological materials were disposed of in the 300-FF-1 waste sites. Throughout the Hanford Site, cleanup operations were completed at six waste sites in 1997 and all Tri-Party Agreement milestones associated with these cleanup operations were either on or ahead of schedule for the year.

The number of remediation projects increased in 1997, which added to the amount of contaminated soils and other waste delivered to the Environmental Restoration Disposal Facility. The quantities of contaminated soils and other waste delivered to the facility from remediation projects in 1997 are provided in Table 2.2.1.

North Slope. Remediation of herbicide-contaminated soil and buried tanks used to store the herbicide 2,4-D was completed on the portion of the site located north of the Columbia River (see Figure 1.0.1) in 1997. The North Slope site contained soils with increased levels of 2,4-D and trace amounts of dioxin. The remediation process included shipping 93 metric tons (103 tons) of dioxin-contaminated soil offsite for incineration and disposal, bioremediating the remaining soils onsite, and transporting 10 crushed tanks offsite for disposal. Following remediation actions, the site was graded and seeded for revegetation. This effort completed cleanup activities on the North Slope.

2.2.3.3 Groundwater Projects

Chromium. Chromium-contaminated groundwater that underlies portions of the 100-D, 100-H, and 100-K Areas (the 100-HR-3 and 100-KR-4 Operable Units) is of potential ecological concern (i.e., impact on Columbia River ecosystem). High levels of chromium are toxic to aquatic organisms, particularly those that use the riverbed sediment as habitat (DOE/RL-94-102, DOE/RL-94-113). In 1994, a groundwater extraction system was installed in the 100-D Area to test chromium removal from groundwater using ion exchange technology. A Record of Decision (1996a) was signed that approved full-scale implementation of groundwater extraction and chromium treatment systems in the 100-D, 100-H, and 100-K Areas.

The test system in the 100-D Area continued to operate until September 1996, when it was shut down to allow construction of the full-scale systems in the 100-D, 100-H, and 100-K Areas (DOE/RL-94-83). Full-scale operation began in July and October 1997 at the 100-HR-3 and 100-KR-4 pump-and-treat sites, respectively. Treated water is reinjected into the ground.

From October through December 1997, operations for the 100-HR-3 pump-and-treat system treated 64.7 million L (17.1 million gal) of water and removed 14.2 kg (31.3 lb) of hexavalent chromium from the aquifer. As of January 31, 1998, the 100-KR-4 pump-and-treat system treated 76.0 million L (20.0 million gal) of groundwater and removed 9.45 kg (20.8 lb) of hexavalent chromium from the aquifer.

Performance monitoring will continue to determine how effectively and efficiently the systems are working at removing chromium from the aquifer. Information gained from experience with this interim remedial measure will be used to help select a final remediation alternative for removing chromium from groundwater underlying the 100 Areas.

To further evaluate chromium contamination in groundwater near the Columbia River shoreline, 178 aquifer sample tubes were installed in 1997. The sample tubes were installed parallel to the shoreline, beginning near the 100-B,C Area and continuing downstream approximately 40 km (25 mi) to near the Old Hanford Townsite. Aquifer sample tubes were installed approximately every 610 m (2,000 ft), except in known chromium-contaminated plumes, where the tubes were installed approximately every 305 m (1,000 ft).

Collected data will provide information to support remediation operations, monitoring objectives, and environmental efforts now and into the future. For example, sample tube data will provide highly detailed information on the distribution of chromium in groundwater entering the river at locations very close to sensitive ecological receptors such as aquatic organisms.

Strontium-90. The 100-NR-2 pump-and-treat system began operation in 1995 north of the N Reactor complex to remove strontium-90 from contaminated groundwater so the flux of strontium-90 to the Columbia River is reduced. The system was upgraded in 1996 and continued to operate through 1997. Operation of the system was optimized to reduce costs without decreasing performance. Treated water is reinjected into the ground. For

Table 2.2.1. Quantities of Contaminated Soils and Other Wastes Disposed of at the Environmental Restoration Disposal Facility, 1997

Location	Metric Tons (tons)	
100-B,C Area	259,000	(285,000)
100-DR Area	221,000	(244,000)
300-FF-1 Operable Unit	37,000	(41,800)
183-H Solar Evaporation Basins	19,200	(21,200)
100-N Area	697	(768)
Other	2,172	(2,390)
Total	539,000	(594,000)

1997, approximately 98.5 million L (26.0 million gal) of water were processed through the upgraded system, and approximately 0.17 Ci of strontium-90 was removed.

Carbon Tetrachloride. The carbon tetrachloride plume in the 200-West Area (underlying the 200-ZP-1 Operable Unit) covers approximately 9 km² (3.5 mi²). In 1994, a pilot-scale pump-and-treat system was initiated to test the removal of carbon tetrachloride and other organics from the groundwater using liquid-phase activated carbon, with the treated groundwater reinjected into the aquifer. Based on the success of the test, a Record of Decision (1995) was issued, requiring implementation of a larger system. The pilot-scale system continued to operate as Phase I of the remedial action until the larger Phase II system started up in August 1996. Phase II operations ended August 8, 1997, and the transition to Phase III began. Following an equipment upgrade to meet Phase III operational requirements, operations were restarted August 29, 1997. The system treats contaminated groundwater using air-stripping and granular activated carbon technology. From January until September 1997, 154 million L (40.8 million gal) of groundwater were treated and 57.82 kg (127.5 lb) of carbon tetrachloride were removed.

Uranium, Technetium-99, Carbon Tetrachloride, and Nitrates. Another groundwater plume in the 200-West Area (underlying the 200-UP-1 Operable Unit) contains uranium, technetium-99, carbon tetrachloride, and nitrates. In 1994, a pilot-scale pump-and-treat system was initiated to test the removal of these contaminants from groundwater using ion exchange. Treated groundwater is reinjected into the aquifer. In 1995, a proposed plan was issued, identifying expansion of the existing system as the preferred alternative for an interim remedial action (DOE/RL-95-26). Public comments suggested that the 200 Areas Effluent Treatment Facility (see Figure 1.0.2) be considered as an alternative to expanding the existing pump-and-treat system, resulting in a reevaluation of the alternatives. A Record of Decision (1997) was issued, requiring that groundwater extracted from wells in the 200-UP-1 Operable Unit be pumped through 11 km (7 mi) of pipeline to the 200 Areas Effluent Treatment Facility for treatment. This transfer began on March 31, 1997. Following treatment, the water is discharged to the State-Approved Land Disposal Site north of the 200-West Area (see Figure 1.0.2).

From January through December 1997, which included a 2-month shutdown to switch operations, approximately

55.5 million L (14.6 million gal) of groundwater were treated. The treatment process removed 0.01 kg (0.02 lb) of technetium-99, 18.3 kg (40.3 lb) of uranium, 1.53 kg (3.38 lb) of carbon tetrachloride, and 3,790 kg (8,355 lb) of nitrates from subsurface water.

2.2.3.4 Vadose Zone Project

A system that extracts carbon tetrachloride vapor from the vadose zone beneath the 200-West Area began in February 1992 and continued through 1997. The soil vapor is passed through granulated activated carbon, which absorbs carbon tetrachloride. The carbon tetrachloride is then shipped offsite for treatment. Because the rate of removal dropped off substantially in 1996, a system shutdown and study were initiated from November 1996 through June 1997 to evaluate the magnitude and rate of carbon tetrachloride concentration rebound. The evaluation was performed by measuring soil gas at extraction sites. Data indicated that carbon tetrachloride concentrations had increased at each of the three extraction systems during the eight-month evaluation period. The extraction systems were restarted in July 1997, and the mass-removal rates gradually declined to preshutdown rates. In 1997, 1,820 kg (4,000 lb) of carbon tetrachloride were removed from the 200-West Area vadose zone.

2.2.3.5 N Area Project

This project was established to coordinate cleanup activities in the 100-N Area and currently includes deactivation and remediation of facilities. Deactivation activities, which began at the N Reactor area in 1993, include removal of high and low dose materials and transfer of radioactive water from the reactor lift station to the 200 Areas Effluent Treatment Facility.

In 1997, cleanup continued in the 100-N Area, including deactivation of 78 of 85 facilities, containment of 90% of the reactor's high dose materials and 95% of the low dose materials, and removal of more than 1.5 million L (400,000 gal) of radioactively contaminated water from N Reactor facilities. Also completed during the year was installation of the emergency dump basin liner to prevent the spread of contamination and protect the basin's steel liner from the elements and definitive design for the N fuel storage basin shielding cover. The emergency dump basin was for emergency storage of N Reactor cooling water when N Reactor was operating.

2.2.3.6 Decommissioning Project

A national agreement (DOE and EPA 1995) to decommission contaminated facilities under Comprehensive Environmental Response, Compensation, and Liability Act authority was implemented at the Hanford Site in 1996 with the preparation of an engineering evaluation/cost analysis for decommissioning facilities in the 100-B,C Area (DOE/RL-96-85). After public review, an action memorandum was signed by the two agencies in January 1997. The memorandum authorizes the removal of certain facilities and the disposal of waste under the Act.

Decontamination and decommissioning continued in 1997, with demolition of the nonradioactive 190-C Water Treatment Facility and six other small facilities in the 100-B,C Area and a 35% reduction in the “footprint” of the C Reactor. In addition, throughout the Hanford Site, 11 technology demonstrations, decontamination and decommissioning of 16 buildings, Phase I feasibility study report on the canyon disposition initiative (DOE/RL-97-11, Rev. 1), and hazard classification requirements for 12 facilities were completed in 1998.

2.2.4 Emergency Planning and Community Right-To-Know Act

This Act requires states to establish a process for developing chemical emergency preparedness programs and to distribute within communities information on hazardous chemicals present in facilities. The Act has two subtitles: Subtitle A includes requirements for emergency planning (Sections 301-303) and emergency release notification (Section 304); Subtitle B requires periodic reporting of chemical inventories and associated hazards (Sections 311-312), releases, and waste management activities (Section 313).

Sections 301-303 require states to establish a state emergency response commission and local emergency planning committees. These organizations are tasked to gather information and develop emergency plans for local planning districts in the state. Facilities that produce, use, or store extremely hazardous substances in quantities above threshold planning quantities must identify themselves to the state emergency response commission and local emergency planning committee, provide any additional

information the local emergency planning committee requires for development of the local emergency response plan, and notify the committee of any changes occurring at the facility that may be relevant to emergency planning. It should be noted that the entire Hanford Site is considered a facility for the purpose of determining threshold planning and reporting quantities. This does not include, however, activities conducted by others on Hanford Site lands covered by leases, use permits, easements, and other agreements whereby land is used by parties other than DOE.

Under Section 304, facilities must also notify the state emergency response commission and local emergency planning committee immediately after an accidental release of an extremely hazardous substance over the reportable quantity established for that substance, and follow up the notification with a written report. Extremely hazardous substances are listed in 40 CFR 355 (Appendixes A and B) along with the applicable threshold planning quantity and reportable quantity.

For a discussion on emergency planning and response activities following the 1997 Plutonium Finishing Plant tank overpressurization incident, refer to Section 2.4, “Environmental Occurrences.”

Sections 311-312 require facilities that store hazardous chemicals in amounts above minimum threshold levels to report information regarding those chemicals to the state emergency response commission, local emergency planning committee, and local fire department. Both sections cover chemicals that are considered physical or health hazards by the Occupational Safety and Health Act Hazard Communication Standard (29 CFR 1910.1200). The minimum threshold level is 4,545 kg (10,000 lb) for hazardous chemicals. If the chemical is an extremely hazardous substance, the minimum threshold level is 277 kg (500 lb) or the listed threshold planning quantity, whichever is less. Section 311 calls for the submittal of a Material Safety Data Sheet for each hazardous chemical present above minimum threshold levels or a listing of such chemicals with associated hazard information. The listing must be updated within 3 months of any change to the list, including receipt of new chemicals above minimum threshold levels or discovery of significant new hazard information regarding existing chemicals. Section 312 requires annual submittal of more detailed quantity and storage information regarding the same list of chemicals in the form of a Tier One or Tier Two Emergency and Hazardous Chemical Inventory report. These

minimum threshold levels apply to the total quantities of such chemicals that are stored or received in aggregate at the Hanford Site, not to individual facilities at the site.

The Hanford Site provides appropriate hazardous chemical inventory information to the Washington State Department of Ecology Community Right-To-Know Unit; local emergency planning committees for Benton, Franklin, and Grant Counties; and to both the Richland and Hanford Site Fire Departments. Updated Material Safety Data Sheet listings were issued in April 1997 and March 1998, covering chemical inventory changes occurring during calendar year 1997. The 1997 Hanford Site Tier Two Emergency and Hazardous Chemical Inventory (DOE/RL-98-17) was issued in February 1998.

Under Section 313, facilities must report total annual releases of certain listed toxic chemicals. The Pollution Prevention Act requires additional information with the report, and Executive Order 12856 (EPA 100-K-93-001) extends the requirements to all federal facilities, regardless of the types of activities conducted.

A toxic chemical release inventory report discusses releases and waste management activities, and includes source reduction information for each chemical manufactured, processed, or otherwise used in amounts over specific threshold levels.

The toxic chemical release reporting status for 1996 was confirmed in May 1997. No report was required because

evaluation of toxic chemical use information showed that no reporting thresholds were exceeded in 1996.

The 1997 toxic chemical release inventory report will be issued in mid-1998 and will consist of information regarding releases, offsite transfers, and source reduction activities regarding phosphoric acid, the sole toxic chemical used in excess of applicable thresholds during 1997. The phosphoric acid was used mostly for B Plant deactivation cleanup work in the 200-East Area.

Table 2.2.2 provides an overview of 1997 Emergency Planning and Community Right-To-Know Act reporting.

2.2.5 Resource Conservation and Recovery Act

2.2.5.1 Hanford Facility Resource Conservation and Recovery Act Permit

This permit (#WA7890008967) was issued by the Washington State Department of Ecology and EPA in August 1994 and has been in effect since late September 1994 (e.g., DOE/RL-91-28, Rev. 3). The permit provides the foundation for all future Resource Conservation and Recovery Act permitting at the Hanford Site in accordance with provisions of the Tri-Party Agreement.

Table 2.2.2. Emergency Planning and Community Right-to-Know Act Compliance Reporting, 1997^(a)

Sections of the Act	<u>Yes</u>	<u>No</u>	<u>Not Required</u>
302-303: Planning notification	X ^(b)		
304: Extremely hazardous substances release notification			X
311-312: Material safety data sheet/chemical inventory (for calendar year 1997)	X		
313: Toxic chemical release inventory reporting (for calendar year 1997)	X		

(a) "Yes" indicates that notifications were provided and/or reports were issued under the applicable provisions. "No" indicates that notifications or reports should have been provided but were not. "Not Required" indicates that no actions were required under the applicable provisions, either because triggering thresholds were not exceeded or no releases occurred.

(b) These notifications apply to the Hanford Site but were completed prior to 1997.

2.2.5.2 Resource Conservation and Recovery Act/Dangerous Waste Permit Applications and Closure Plans

For purposes of the Resource Conservation and Recovery Act and Washington State's dangerous waste regulations (Washington Administrative Code [WAC] 173-303), the Hanford Site is considered to be a single facility that encompasses over 60 treatment, storage, and disposal units. The Tri-Party Agreement recognized that all of the treatment, storage, and disposal units cannot be permitted simultaneously and set up a schedule for submitting unit-specific Part B Resource Conservation and Recovery Act/dangerous waste permit applications and closure plans to the Washington State Department of Ecology and EPA.

During 1997, 9 Part A, Form 3 revisions and 1 new Part A, Form 3 were certified and submitted to the Washington State Department of Ecology. Also in 1997, 4 Part B permit applications and 1 new Part B permit application were certified and submitted. In addition, three notices of intent for expansion were filed with the Washington State Department of Ecology, and one clean-closure action and two procedural closure actions were completed.

2.2.5.3 Resource Conservation and Recovery Act Groundwater Monitoring Project Management

Table 2.2.3 lists the Resource Conservation and Recovery Act facilities and units (or waste management areas) that currently require groundwater monitoring and notes their monitoring status. Samples were collected from approximately 239 Resource Conservation and Recovery Act wells sitewide in 1997. This is about the same number of wells sampled during 1996. Groundwater samples were analyzed for a variety of dangerous waste constituents and site-specific constituents, including selected radionuclides. The constituent lists meet the minimum Resource Conservation and Recovery Act regulatory requirements and are integrated to supplement other groundwater project requirements (e.g., Comprehensive Environmental Response, Compensation, and Liability Act) at the Hanford Site. During 1997, no new Resource Conservation and Recovery Act wells were installed, but 11 new wells are scheduled to be added during 1998. Of these 11, 8 will replace network wells going dry as a result of declining groundwater conditions in the 200-West Area, one well is for an assessment at the B-BX-BY Waste

Management Area in the 200-East Area, and one is to enhance the detection program at the U Waste Management Area in the 200-West Area. In addition, one borehole is being added to characterize and monitor a proposed new facility (the Immobilized Low-Activity Waste Disposal Complex) located in the 200-East Area.

At the end of 1997, 16 waste management areas were monitored under detection programs, with no evidence that they were adversely affecting groundwater quality. Nine waste management areas were monitored under assessment or compliance programs to determine the impacts of contamination detected in groundwater at those areas. Highlights of 1997 Resource Conservation and Recovery Act monitoring activities are summarized below.

Four of the seven single-shell tank waste management areas were monitored under assessment programs in 1997 primarily to determine the source of contamination detected in downgradient and surrounding wells. The groundwater quality assessment results for Waste Management Areas T, TX-TY, S-SX (200-West Area) and B-BX-BY (200-East Area) were released in early 1998 (PNNL-11809, PNNL-11810, PNNL-11826). These results concluded that the tank farms cannot be ruled out as a potential source of groundwater contamination. The report findings require groundwater monitoring at Waste Management Areas T, TX-TY, S-SX, and B-BX-BY to continue under a new phase (II) of assessment, which will be defined during 1998.

The interim status groundwater quality assessment results for the 216-U-12 Crib (200-West Area) were reported during 1997 (PNNL-11574), and concluded that the crib is the source of nitrate and technetium-99 contamination in the groundwater. Regulations require the site remain in assessment monitoring. The objectives of the assessment monitoring program are to 1) determine if the flux of constituents out of the vadose zone into the groundwater is increasing or decreasing, 2) monitor the known contaminants until a near-term interim corrective action is defined, and 3) monitor under interim status assessment until a final-status monitoring plan is implemented during closure of the facility.

The interim status groundwater quality assessment results for the 216-B-3 Pond (200-East Area) were reported during 1997 (PNNL-11604) and, it was concluded that the pond contributed no detectable hazardous waste contamination to groundwater, despite erratic elevated total

Table 2.2.3. Status of Resource Conservation and Recovery Act Facilities and Waste Management Areas Requiring Groundwater Monitoring, 1997

TSD ^(a) Units, Date Initiated	Interim-Status TSD ^(a) Unit Groundwater Monitoring		Final-Status TSD ^(a) Unit Groundwater Monitoring		Associated (CERCLA) ^(c) Groundwater Operable Units	Year Scheduled for Part B or Closure
	Indicator Parameter Evaluation ^(b)	Groundwater Quality Assessment, Date Initiated	Compliance Evaluation	Regulatory Requirements		
120-D-1 Ponds, April 1992	X			40 CFR 265.93(b) WAC 173-303-400	100-HR-3	1998 ^(d)
183-H Solar Evaporation Basins, June 1985			X	WAC 173-303-645 (10)	100-HR-3	1994 ^(d)
1301-N LWDF, ^(e) December 1987	X			40 CFR 265.93(b) WAC 173-303-400	100-NR-2	1999 ^(d)
1324-N/NA Pond, December 1987	X			40 CFR 265.93(b) WAC 173-303-400	100-NR-2	1998 ^(d)
1325-N LWDF, ^(e) December 1987	X			40 CFR 265.93(b) WAC 173-303-400	100-NR-2	1999 ^(d)
216-B-3 Pond, November 1988	X			40 CFR 265.93(d) WAC 173-303-400	200-PO-1	2000 ^(d)
216-A-29 Ditch, November 1988	X			40 CFR 265.93(b) WAC 173-303-400	200-PO-1	2000 ^(d)
216-A-10 Crib, ^(f) November 1988		X, 1997		40 CFR 265.93(b) WAC 173-303-400	200-PO-1	>2000 ^(d)
216-A-36B Crib, ^(f) May 1988		X, 1997		40 CFR 265.93(b) WAC 173-303-400	200-PO-1	2000 ^(d)
216-A-37-1 Crib, ^(f) 1997		X, 1997		40 CFR 265.93(d) WAC 173-303-400	200-PO-1	1998 ^(d)
216-B-63 Trench, August 1991	X			40 CFR 265.93(b) WAC 173-303-400	200-PO-1	>2000 ^(d)
216-S-10 Pond, August 1991	X			40 CFR 265.93(b) WAC 173-303-400		>2000 ^(d)

Table 2.2.3. (contd)

TSD ^(a) Units, Date Initiated	Interim-Status TSD ^(a) Unit Groundwater Monitoring		Final-Status TSD ^(a) Unit Groundwater Monitoring		Associated (CERCLA) ^(c) Groundwater Operable Units	Year Scheduled for Part B or Closure
	Indicator Parameter Evaluation ^(b)	Groundwater Quality Assessment, Date Initiated	Compliance Evaluation	Regulatory Requirements		
216-U-12 Crib, September 1991		X, 1993		40 CFR 265.93(d) WAC 173-303-400	200-UP-1	>2000 ^(d)
LERF, ^(g) July 1991	X			40 CFR 265.93(b) WAC 173-303-400		1997 ^(h)
LLBG ⁽ⁱ⁾ WMA-1, ⁽ⁱ⁾ September 1988	X			40 CFR 265.93(b) WAC 173-303-400		1997 ^(h)
LLBG ⁽ⁱ⁾ WMA-2, ⁽ⁱ⁾ September 1988	X			40 CFR 265.93(b) WAC 173-303-400		1997 ^(h)
LLBG ⁽ⁱ⁾ WMA-3, ⁽ⁱ⁾ October 1988	X			40 CFR 265.93(b) WAC 173-303-400		1997 ^(h)
LLBG ⁽ⁱ⁾ WMA-4, ⁽ⁱ⁾ October 1988	X			40 CFR 265.93(b) WAC 173-303-400	200-ZP-1	1997 ^(h)
WMA-A-AX ^(j) SST, ^(k) February 1990	X			40 CFR 265.93(b) WAC 173-303-400		>2000 ^(d)
WMA-B-BX-BY ^(j) SST, ^(k) February 1990		X, 1996		40 CFR 265.93(d) WAC 173-303-400		>2000 ^(d)
WMA-C ^(j) SST, ^(k) February 1990	X			40 CFR 265.93(b) WAC 173-303-400	200-PO-1	>2000 ^(d)
WMA-S-SX ^(j) SST, ^(k) October 1991		X, 1996		40 CFR 265.93(d) WAC 173-303-400	200-UP-1	>2000 ^(d)
WMA-T ^(j) SST, ^(k) February 1990		X, 1993		40 CFR 265.93(d) WAC 173-303-400	200-ZP-1	>2000 ^(d)

Table 2.2.3. (contd)

TSD ^(a) Units, Date Initiated	Interim-Status TSD ^(a) Unit Groundwater Monitoring		Final-Status TSD ^(a) Unit Groundwater Monitoring		Associated (CERCLA) ^(e) Groundwater Operable Units	Year Scheduled for Part B or Closure
	Indicator Parameter Evaluation ^(b)	Groundwater Quality Assessment, Date Initiated	Compliance Evaluation	Regulatory Requirements		
WMA-TX-TY ⁽ⁱ⁾ SST, ^(k) September-October 1991		X, 1993		40 CFR 265.93(d) WAC 173-303-400	200-ZP-1	>2000 ^(d)
WMA-U ⁽ⁱ⁾ SST, ^(k) October 1990	X			40 CFR 265.93(b) WAC 173-303-400	200-ZP-1	>2000 ^(d)
316-5 Area Process Trenches, June 1985			X, 1996	WAC 173-303-645 (10)	300-FF-5	1996 ^(d)
NRDWL, ^(l) October 1986	X			WAC 173-303-400	40 CFR 265.93(b) 200-PO-1	>2000 ^(d)

(a) Treatment, storage, and/or disposal.

(b) Specific parameters (pH, specific conductance, total organic carbon, and total organic halides) used to determine if a facility is affecting groundwater quality. Exceeding the established limits means that additional evaluation and sampling are required (groundwater quality assessment). An X in the groundwater quality assessment column indicates that an assessment was required.

(c) Comprehensive Environmental Response, Compensation, and Liability Act.

(d) Closure/postclosure plan; treatment, storage, and/or disposal unit will close under final status.

(e) Liquid waste disposal facility.

(f) 216-A-10, 216-A-36B, and 216-A-37-1 cribs were combined in fiscal year 1997 into one Resource Conservation and Recovery Act monitoring unit. Resource Conservation and Recovery Act monitoring will be performed according to interim-status groundwater quality assessment requirements.

(g) Liquid effluent retention facility.

(h) Part B permit; treatment, storage, and/or disposal unit will operate under final-status regulations beginning in year indicated.

(i) Low-level burial ground.

(j) Waste management area.

(k) Single-shell tank.

(l) Nonradioactive Dangerous Waste Landfill.

> = Beyond the year 2000.

organic halides in the groundwater. The site reverted to a detection monitoring program in October 1997.

The 183-H Solar Evaporator Basins (100-H Area) were monitored under final-status regulations during 1997. The basins have contaminated the groundwater with technetium-99, uranium, nitrate, and chromium to levels exceeding applicable concentration limits. Corrective action will be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act program, and an interim remedial action (pump-and-treat system) for chromium began in 1997. Groundwater monitoring to meet Resource Conservation and Recovery Act requirements will continue during the remediation process.

The 316-5 Process Trenches (300 Area) changed from an interim-status assessment program to a final-status compliance-monitoring program in December 1996. The site was immediately moved to a corrective action program because the regulatory concentration limits for some constituents (radioactive and chemical) were exceeded. A corrective action plan was submitted to the Washington State Department of Ecology and is scheduled to be implemented in 1998 (WHC-SD-EN-AP-185). Natural attenuation of the contaminants through continued declining concentrations is the corrective action approved under the Comprehensive Environmental Response, Compensation, and Liability Act (Record of Decision 1996b). Groundwater monitoring will continue under the Resource Conservation and Recovery Act to determine the attenuation of the elevated contaminants.

The monitoring programs for the 216-A-10, 216-A-36B, and 216-A-37-1 Cribs (200-East Area) were combined into a single assessment program in 1997. Specific conductance is elevated downgradient of the cribs and has a direct correlation with nitrate and tritium contaminant plumes in the area.

The results of groundwater monitoring are discussed in detail in Section 6.1, "Hanford Groundwater Monitoring Project."

2.2.5.4 Resource Conservation and Recovery Act Inspections

DOE and its contractors are working to resolve outstanding notices of violation and warning letters of noncompliance from the Washington State Department of Ecology that were received during 1997. Each of these notices lists specific violations. There were four Resource Conservation and Recovery Act-related notices of violation

and warning letters in 1997. Of these, one has had all corrective actions completed and has been closed. Two of the 1997 issues were formal violations, resulting in fines totaling \$200,000. Below is a brief summary of the three most significant of these four issues.

- The Washington State Department of Ecology issued a Notice of Correction for improper waste storage (satellite accumulation area) at the 222-S Laboratory in the 200-West Area in early 1996. On November 7, 1996, the Washington State Department of Ecology levied a \$90,000 penalty against DOE Richland Operations Office and its subcontractors for improper storage of waste in February 1996. DOE Richland Operations Office issued a letter to the Pollution Control Hearings Board requesting relief from the penalty. A hearing has been set for early 1998.
- The Washington State Department of Ecology issued a Notice of Violation and Penalty to DOE Richland Operations Office for the storage of incompatible waste at the Plutonium Finishing Plant in the 200-West Area. The contents of a tank containing liquid chemicals evaporated and concentrated, resulting in a reaction causing the tank to pressurize and explode. No workers were seriously injured but the explosion caused damage to a portion of the Plutonium Reclamation Facility, which is part of the Plutonium Finishing Plant. The Notice of Violation included a penalty of \$110,000 levied against DOE Richland Operations Office and its subcontractors. A request for a relief from penalty was filed with the Pollution Control Hearings Board. A hearing date has not yet been set. Emergency preparedness and notifications were highlighted as problems in the Notice of Violation. All Hanford Site contractors are working with the Washington State Department of Ecology to improve emergency preparedness onsite and to evaluate the status and condition of all tanks on the Hanford Site.
- In December 1997, at T Plant in the 200-West Area, some questionable materials were found in containers of debris waste from the 324, 325, and 327 Buildings in the 300 Area. Offices in these facilities had been cleaned out, and potentially hazardous materials (e.g., flashlight batteries, light bulbs, and metal-laden materials) from these offices were accidentally placed into the containers and shipped to T Plant for verification and disposal. The Washington State Department of Ecology performed an investigation of the suspect waste containers and issued a Notice

of Correction for improper designation of waste. This issue was closed on March 25, 1998.

2.2.6 Clean Air Act

Local, state, and federal agencies enforce standards and requirements for regulation of air emissions at federal facilities such as the Hanford Site, under the Clean Air Act (Section 118). A summary of the major agency interfaces and applicable regulations for the Hanford Site is provided in the following paragraphs.

The Washington State Department of Health's Division of Radiation Protection regulates radioactive air emissions statewide through delegated authority from EPA and its implementing regulation (WAC 246-247). Applicable controls and annual reporting of all radioactive air emissions are required. The Hanford Site operates under state license FF-01 for such emissions. The conditions specified in the license will be incorporated into the Hanford Site air operating permit, scheduled to be issued in mid-1998 in accordance with Title V of the Clean Air Act and 1990 amendments and the federal and state programs under 40 CFR 70 and WAC 173-401, respectively. The Hanford Site air operating permit will include a compilation of requirements for both radioactive emissions now covered by the existing FF-01 license and nonradioactive emissions. It requires the owner (DOE Richland Operations Office) to submit periodic reports and an annual compliance certification to the state.

Revised requirements for radioactive air emissions were issued in December 1989 under 40 CFR 61, Subpart H. The total emissions from the Hanford Site's DOE operations are within the state and EPA offsite emission standard of 10 mrem/yr. The 1989 requirements for flow and emissions measurements, quality assurance, and sampling documentation have been implemented at all Hanford Site sources and/or are tracked for milestone progress, as discussed below, in accordance with a schedule with the Washington State Department of Health.

Reporting and monitoring requirements necessitate evaluation of all radionuclide emission points on the Hanford Site to determine those subject to continuous emission measurement requirements in 40 CFR 61, Subpart H. In February 1994, the hazardous air pollutants federal facility compliance agreement for the Hanford Site was signed by the EPA Region 10 and DOE and provides a compliance plan and schedule that are being followed to bring

the Hanford Site into compliance with the Clean Air Act, as amended, and its implementing regulations in 40 CFR 61. All federal facility compliance agreement milestones were met during 1997, and Hanford Site air emissions remained below all regulatory limits set for radioactive and other pollutants.

The Washington State Department of Ecology enforces state regulatory controls for air contaminants as allowed under the Washington Clean Air Act (Revised Code of Washington [RCW] 70.94). The implementing requirements (e.g., WAC 173-400 and 173-460) specify applicable controls, reporting, notifications, permitting, and provisions of compliance with the general standards for applicable Hanford Site sources.

Pursuant to 40 CFR 61, Subpart M, EPA promulgated regulations specifically addressing asbestos emissions. These regulations apply at the Hanford Site in building demolition and/or renovation and waste disposal operations. The asbestos is handled according to the *Hanford Site Asbestos Abatement Plan* (BHI-00010, Rev. 2) and/or in accordance with approved contractor procedures. The plan is updated annually by the DOE Richland Operations Office Site Infrastructure Division and contains an inventory of all buildings on the Hanford Site that contain asbestos, as well as an annual projection of the amount of asbestos to be handled and disposed.

Title VI of the Clean Air Act, 1990 Amendments, requires regulation of the service, maintenance, repair, and disposal of appliances containing Class I and Class II ozone-depleting substances (refrigerants) through implementation of the requirements in 40 CFR 82. In 1994, the site management and operation contractor was assigned the lead by DOE directive to coordinate the development of a sitewide plan to implement the Title VI requirements. As a result, implementation of the EPA requirements for ozone-depleting substance management on the Hanford Site was administered through the sitewide implementation plan (DOE/RL-94-86). The continued need for this implementation plan is being evaluated by DOE Richland Operations Office to determine if it should be updated to reflect changes in Hanford Site contractor relationships and applicable federal regulations.

The Benton County Clean Air Authority enforces Regulation 1, which pertains to detrimental effects, fugitive dust, open burning, and asbestos handling. The Benton County Clean Air Authority has been delegated the authority to enforce EPA asbestos regulations under the national emission standards for hazardous air pollutants

(40 CFR 61, Subpart M). In 1997, there were no compliance issues identified for the Hanford Site pursuant to these regulations.

During 1997, routine reports and/or notifications of air emissions were provided to each air quality agency in accordance with requirements.

2.2.6.1 Clean Air Act Enforcement Inspections

DOE and its contractors are working to resolve outstanding compliance findings from the Washington State Departments of Health and Ecology inspections. Each of these findings lists specific violations. There were four Washington State Department of Health Notices of Correction in 1997 and none from the Washington State Department of Ecology. A brief summary of the three most significant of these issues follows.

- The Washington State Department of Health investigated the chemical tank overpressurization at the Plutonium Finishing Plant (200-West Area) to determine if any radioactive releases occurred (see Section 2.2.5.4, “Resource Conservation and Recovery Act Inspections” for details of the event). There was no indication that above-background levels of contaminants were released from the building following the explosion. No response has been received subsequent to the investigation from the Washington State Department of Health on this issue.
- A Notice of Correction was issued by the State of Washington Department of Health to DOE Richland Operations Office for the use of outdated procedures in T Plant (200-West Area). Two manuals referenced in the procedures were canceled, with no replacements implemented. The Washington State Department of Health indicated that the canceled manuals need to be reissued. Their concern is that quality control procedures were deleted with no replacements issued. New procedures are being prepared and are scheduled to be implemented in June 1998. This implementation date has been accepted by the Washington State Department of Health.
- A Notice of Correction was issued by the Washington State Department of Health to DOE Richland Operations Office for failure to notify within 24 hours the excursion at the Waste Encapsulation Storage Facility in the B Plant Complex (200-East Area). The

Notice of Correction indicated that the filters in the 296-B-10 Stack were potentially compromised, resulting in the exceedance of the as low as reasonably achievable control technology standard set forth in WAC-246-247-080(5). The Washington State Department of Health indicated that notification was not received until 6 days after the event and that a clear policy is needed to ensure the department is properly notified. DOE Richland Operations Office sent notices to its contractors asking them to demonstrate the implementation of the notification requirements found in the regulations, has indicated that the notification policy will be included in the air operating permit expected to be issued to the site by the Washington State Department of Ecology in 1998. This issue remains open.

2.2.7 Clean Water Act

The Clean Water Act applies to point source discharges to waters of the United States. At the Hanford Site, the regulations are applied through National Pollutant Discharge Elimination System (40 CFR 122) permits that govern effluent discharges to the Columbia River.

A request to remove inactive outfalls 005, 006, 007, 009, and N Springs (100-N Area) from the monitoring and reporting requirements in the permit (#WA-000374-3) was submitted to EPA in August 1997. The EPA indicated informally that DOE could discontinue monitoring of these outfalls without a permit modification, with the exception of the well that monitors N Springs. A formal response has not been received from the EPA. The active outfalls at the Hanford Site include two located in the 100-K Area (outfalls 003 and 004) and one in the 300 Area (outfall 013). There was one instance of noncompliance, related to a missed sample at N Springs, for this permit in 1997 (Table 2.2.4).

An application for a permit modification for the 300 Area Treated Effluent Disposal Facility (permit #WA-002591-7) was submitted to the EPA in November 1997. The application requested the transfer of outfalls 003 and 004 (100-K Area) from existing permit #WA-000374-3 to permit #WA-002591-7. The 100-N outfalls (005, 006, 007, 009, and N Springs), currently identified in permit #WA-000374-3, were not included in the application because discharges to these outfalls have ceased. A summary discussing why another outfall (013A in the

Table 2.2.4. Water Permit Exceedances or Noncompliances at the Hanford Site, 1997

Permit/Outfall	Parameter	Date(s) Exceeded	Comments
National Pollutant Discharge Elimination System			
300 Area Treated Effluent Disposal Facility	Bis (2-ethylhexyl) phthlate	June 1997, August 1997	None
	Nitrite	June 1997	Only testing method available does not differentiate between nitrite and nitrate unless specified.
	Radium-228	November 1997	Later clarification with EPA regarding reporting indicated that this would not have been a noncompliance.
1301 (N Springs, 100-N Area)	Oil and grease, iron, ammonia, chromium, and temperature	December 1997	Missed sampling because of equipment malfunction.
State Waste Discharge Permit ST 4508			
Hanford Site	20-minute discharge duration limit	July 11, 1997, August 18, 1997, August 19, 1997	None
State Waste Discharge Permit ST 4507			
100-N Sewage Lagoon	Biochemical oxygen demand	July 31, 1997	None
State Waste Discharge Permit ST 4503			
183-N Backwash Discharge Pond	pH and trihalo-methanes	August 1997	Attributed to elevated chlorine; system operations modified.
State Waste Discharge Permit ST 4500			
200 Areas Effluent Treatment Facility	Sulfate	February 6, 1997, April 21, 1997, June 30, 1997	Attributed to dissolution of calcium sulfate in soil.
State Waste Discharge Permit ST 4502			
200 Areas Treated Effluent Disposal Facility	Iron	January 12, 1997	None
State Waste Discharge Permit ST 4501			
400 Area Secondary Cooling Water	Total dissolved solids	January 2, 1997	Cooling towers were contributing factor; system operations were modified.
	Manganese	July 7, 1997	Elevated manganese present in source water.
	Manganese and total dissolved solids	August 27, 1997	Elevated manganese present in source water; cooling towers were contributing factor; system operations were modified.

300 Area) should be exempt from permitting was also attached to the application. A revised permit is expected to be issued in 1998.

Permit #WA-002591-7 covers the 300 Area Treated Effluent Disposal Facility, which had 4 permit exceedances in 1997. All four were the result of contaminant levels in effluents exceeding the permit limits. This facility was in normal operation and meeting design specifications at the time of these events. All indications suggest that the facility is unable to consistently meet the restrictions of the permit despite the use of the best available technology.

The Hanford Site is covered by two stormwater permits (WAR-00-000F, WAR-10-000F). In compliance with the industrial stormwater discharge permit, an annual comprehensive site compliance evaluation was performed and documented in 1997 (HNF-SD-ENV-EE-004).

DOE Richland Operations Office was issued a pretreatment permit (CR-IU005) from the city of Richland in 1997 for the discharge of wastewater from the Environmental and Molecular Sciences Laboratory. Also, there are numerous sanitary waste discharges to the ground, as well as 400 Area sanitary waste discharge to the Washington Public Power Supply System treatment facility. Sanitary waste from the 300 Area, 1100 Area, and other facilities north of, and in, Richland discharge to the city of Richland treatment facility.

Refer to Table 2.2.4 for a summary of all site water permit exceedances and noncompliances in 1997.

2.2.7.1 Liquid Effluent Consent Order

The Washington State Department of Ecology liquid effluent consent order (DE 91NM-177), which regulates Hanford Site liquid effluent discharges to the ground, contains compliance milestones for Hanford Site liquid effluent streams designated as Phase I, Phase II, and Miscellaneous Streams. State waste discharge permit applications are being submitted to the Washington State Department of Ecology for all liquid effluent streams subject to regulation by the Consent Order. Three new state waste discharge permits were issued by the Washington State Department of Ecology in 1997 and include Permit ST 4508 for hydrotest, maintenance, and construction discharges (issued May 30, 1997); Permit ST 4507 for the 100-N Sewage Lagoon (issued May 12, 1997); and Permit ST 4503 for the 183-N Backwash Discharge Pond (issued May 12, 1997). A single one time/limited

duration discharge permit was obtained for Project L-275 in support of fire protection line construction and flushing activities.

In 1997, there were 12 noncompliances among the 7 state waste discharge permits currently in place at the Hanford Site. Refer to Table 2.2.4 for additional information.

The first Hanford Site miscellaneous streams categorical permit was issued by the Washington State Department of Ecology for hydrotest, maintenance, and construction discharges. The permit became effective May 30, 1997 and expires on May 30, 2002. The Washington State Department of Ecology issued the second miscellaneous streams categorical permit for cooling water and condensate discharges on May 1, 1998. A permit application covering the third and last miscellaneous streams categorical permit for stormwater discharges is due to the Washington State Department of Ecology by September 1998.

2.2.8 Safe Drinking Water Act

The national primary drinking water regulations of the Safe Drinking Water Act apply to the drinking water supplies at the Hanford Site. The Washington State Department of Health enforces these regulations. The Hanford Site water supplies are monitored for the contaminants listed in the rules and regulations of the Washington State Department of Health regarding public water systems (WAC 246-290). In 1997, one constituent in one water supply system sample was detected at a concentration in excess of its maximum contaminant level. Results of a sample collected at the Fast Flux Test Facility on June 25, 1997 indicated manganese concentrations of 0.082 mg/L, which is above the 0.05-mg/L maximum contaminant level. Groundwater in the 400 Area, which is used as the drinking water source at the Fast Flux Test Facility, contains naturally occurring manganese. Manganese is considered a secondary contaminant per WAC 246-290-310 and poses no threat to human health and the environment. Appropriate notifications were made and no further action was required.

2.2.9 Toxic Substances Control Act

Toxic Substances Control Act requirements applied to the Hanford Site essentially involve regulation of polychlorinated biphenyls. Federal regulations for use, storage,

and disposal of polychlorinated biphenyls are found in 40 CFR 761. The EPA expects to issue a revision to these regulations during 1998. The state of Washington also regulates certain classes of polychlorinated biphenyls through the dangerous waste regulations in WAC 173-303.

Electrical transformers on the Hanford Site have been sampled and characterized. Fourteen transformers with polychlorinated biphenyl concentrations greater than 500 ppm remain in service. Schedules have been developed and are being followed for the replacement and disposal of these transformers.

Defueled, decommissioned naval reactor compartments shipped by the United States Navy to the Hanford Site for disposal contain small quantities of polychlorinated biphenyls, which are tightly bound in materials such as thermal insulation, cable coverings, and rubber. Because polychlorinated biphenyls are present, the reactor compartments are regulated under this Act. A compliance agreement between EPA and DOE defines the process by which a chemical waste landfill approval under this Act will be issued for the reactor compartment disposal trench.

Nonradioactive polychlorinated biphenyl waste is stored and disposed of in accordance with 40 CFR 761 requirements. Radioactive polychlorinated biphenyl waste remains in storage onsite, pending the development of adequate treatment and disposal technologies and capacities. A DOE-wide federal facilities compliance agreement, allowing the storage of radioactive polychlorinated biphenyl wastes beyond the regulatory limit set forth in 40 CFR 761, was approved in August 1996. This agreement includes a requirement for submittal of an annual report to EPA describing the wastes being stored. The most recent report (DOE 1998) was submitted by DOE Richland Operations Office to Headquarters in January 1998. In 1997, Pacific Northwest National Laboratory continued research under a research and development permit from the EPA to study degradation of polychlorinated biphenyls in waste matrices. The research and development permit was extended from December 12, 1997 to December 12, 1998 to allow continued research of polychlorinated biphenyl destruction techniques.

2.2.10 Federal Insecticide, Fungicide, and Rodenticide Act

This Act is administered by the EPA. The standards administered by the Washington State Department of

Agriculture to regulate the implementation of the Act in Washington State include: Washington Pesticide Control Act (RCW 15.58), Washington Pesticide Application Act (RCW 17.21), and rules relating to general pesticide use codified in WAC 16-228. At the Hanford Site, all pesticides are applied by commercial pesticide operators who are listed on one of two commercial pesticide applicator licenses. In 1997, the Hanford Site was in compliance with these state and federal standards that regulate the storage and use of pesticides.

2.2.11 Endangered Species Act

Many rare species of native plants and animals are known to exist on the Hanford Site. Four species that may occur onsite (the bald eagle, peregrine falcon, Aleutian Canada goose, and steelhead trout) are listed by the U.S. Fish and Wildlife Service as endangered or threatened. Others are listed by the Washington State Department of Fish and Wildlife as endangered, threatened, or sensitive species (Appendix F). The site wildlife monitoring program is discussed in Section 7.2, "Ecosystem Monitoring (Plants and Wildlife)."

Bald eagles, a threatened species, are seasonal visitors to the Hanford Site. Several nesting attempts along the Hanford Reach were documented by Pacific Northwest National Laboratory in the 1990s. In compliance with the Endangered Species Act, the Hanford Site bald eagle management plan (DOE/RL-94-150) was finalized in 1994. That plan established temporal 800-m (2,600-ft) access restriction zones around all active nest sites and 6 major communal roosting sites. If activities at the historical nesting sites are observed in January and early February, access roadways are restricted. In 1997, two nests were built by pairs of eagles. The nesting eagles eventually left the area without successfully producing offspring.

The peregrine falcon and the Aleutian Canada goose are rarely observed on the site. Steelhead and salmon are regulated as evolutionary significant units by the National Marine Fisheries Service based on their historical geographic spawning areas. The upper Columbia River evolutionary significant unit was listed as threatened in August 1997. In March 1998, the Mid-Columbia River evolutionary significant units for steelhead and spring-run chinook salmon were proposed for listing as threatened and endangered, respectively. A Hanford Site

steelhead management plan is being prepared. That plan will serve as the formal consultation with the National Marine Fisheries Service as required under the Endangered Species Act. Like the bald eagle management plan, that plan will discuss mitigation strategies and will list project activities that can be conducted without impacting steelhead trout or their habitats.

As part of the National Environmental Policy Act review process, an ecological review was conducted on all projects to evaluate their potential of affecting federal- and/or state-listed species within the proposed project area (PNNL-6415, Rev. 9). The ecological review included quantifying impacts that might result and identifying mitigation strategies to minimize or eliminate such impacts.

2.2.12 National Historic Preservation Act, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, and American Indian Religious Freedom Act

Cultural resources on the Hanford Site are subject to the provisions of these four Acts. Compliance with the applicable regulations is accomplished through an active management and monitoring program that includes a review of all proposed projects to assess potential impacts on cultural resources, periodic inspections of known archaeological and historic sites to determine their condition and eligibility for listing on the National Register of Historic Places, determination of the effects of land management policies on the sites and buildings, and management of a repository for federally owned archaeological collections. In 1997, 151 reviews were requested and conducted on the Hanford Site.

The American Indian Religious Freedom Act requires federal agencies to help protect and preserve the rights of Native Americans to practice their traditional religions. DOE cooperates with Native Americans by providing site access for organized religious activities.

There were no compliance issues during 1997.

2.2.13 National Environmental Policy Act

This Act requires preparation of appropriate documentation to analyze potential impacts associated with proposed federal actions. An environmental impact statement is required to analyze the impacts associated with major federal actions that have the potential to affect the quality of the human environment significantly. Other National Environmental Policy Act documents include an environmental assessment, which is prepared to determine if a proposed action has the potential to impact the environment significantly and, therefore, would require the preparation of an environmental impact statement. Certain types of actions may fall into categories that have already been analyzed by DOE and have been determined not to result in a significant environmental impact. These actions, which are called categorical exclusions, are exempt from further National Environmental Policy Act review. Typically, over 20 specific categorical exclusions are documented by DOE Richland Operations Office annually, involving a wide variety of actions by multiple contractors. In addition, sitewide categorical exclusions are applied to hundreds of routine, typical actions conducted daily on the Hanford Site. There were 19 sitewide categorical exclusions in 1997.

The Council on Environmental Quality, which reports directly to the President, was established to oversee the National Environmental Policy Act process. National Environmental Policy Act documents are prepared and approved in accordance with Council on Environmental Quality National Environmental Policy Act regulations (40 CFR 1500-1508), DOE National Environmental Policy Act implementation procedures (10 CFR 1021), and DOE Order 451.1A. In accordance with DOE Order 451.1A, DOE documents prepared for Comprehensive Environmental Response, Compensation, and Liability Act projects incorporate National Environmental Policy Act values such as analysis of cumulative, offsite, ecological, and socioeconomic impacts to the extent practicable in lieu of preparing separate National Environmental Policy Act documentation.

2.2.13.1 Recent Environmental Impact Statements

Potential environmental impacts associated with ongoing, major activities at the Hanford Site have been analyzed

in environmental impact statements issued in the past several years, followed by records of decision. Additional National Environmental Policy Act reviews, as appropriate, are being conducted during the course of the actions, moving forward as described in the records of decision.

A final environmental impact statement for the Hanford Reach of the Columbia River was issued in June 1994 (National Park Service 1994). The proposed action is to designate the Hanford Reach of the Columbia River a recreational river under the National Wild and Scenic Rivers System, and designate the Wahluke Slope and Columbia River corridor areas of the DOE's Hanford Site a wildlife refuge under the U.S. Fish and Wildlife Service. The record of decision was issued in July 1996 (Babbitt 1996). No final decision regarding the Hanford Reach has been attained to date; discussions in the Senate and House of Representatives are ongoing.

A final environmental impact statement, coprepared by the Washington State Department of Ecology and DOE, for the Hanford Site's tank waste remediation system was issued in August 1996 (DOE/EIS-0189). The proposed actions are the retrieval of radioactive wastes from double- and single-shell waste tanks at the Hanford Site and subsequent stabilization of the wastes in forms suitable for disposal. The Record of Decision was issued in February 1997 (62 FR 8693).

2.2.13.2 Programmatic Environmental Impact Statements

A final programmatic environmental impact statement was issued in December 1996 (DOE/EIS-0229) to analyze alternatives for the long-term storage of all weapons-usable fissile materials and the disposition of plutonium that is no longer needed for national defense purposes. This environmental impact statement considers the Hanford Site as one of four candidates for storage of weapons-usable materials. The environmental impact statement record of decision was issued in January 1997 (62 FR 3014).

A final programmatic environmental impact statement was issued in May 1997 (DOE/EIS-0200F) to evaluate management and siting alternatives for the treatment, storage, and disposal of five types of radioactive and hazardous waste. Hanford was considered in all alternatives. A record of decision was issued in 1998 (63 FR 3629) on treatment and storage of transuranic waste. Other records of decision are expected on this environmental impact statement.

2.2.13.3 Site-Specific Environmental Impact Statements In Progress

An environmental impact statement is being prepared for the Hanford Remedial Action Program. The proposed action would develop a comprehensive land use plan for the Hanford Site. A draft environmental impact statement was issued in August 1996 (DOE/EIS-0222D). In response to public comment, a second draft is being prepared with the cooperation of tribal governments, counties, the city of Richland, and federal agencies. It is expected that the second draft environmental impact statement will be issued for public comment during the summer of 1998. A final environmental impact statement is expected in the autumn of 1998.

2.2.14 Hanford Site Permitting Summary

The Hanford Site has obtained, or is in the process of obtaining, numerous environmental permits. The permits and their status are summarized in *Annual Hanford Site Environmental Permitting Status Report* (DOE/RL-96-63, Rev. 1). For Resource Conservation and Recovery Act permitting, the Hanford Site is considered a single facility and has been issued one EPA identification number. The identification number encompasses over 60 treatment, storage, and/or disposal units. (Three additional identification numbers were effective in November 1996. However, these do not apply to treatment, storage, and disposal units.) The initial Hanford Facility Resource Conservation and Recovery Act Permit was issued for less than the entire facility because all units cannot be permitted simultaneously. The permit, through the permit modification process, will eventually incorporate all treatment, storage, and disposal units.

Implementation of the Clean Air Act is facilitated by several permits. Title V of the Act requires an air operating permit for major stationary sources. The Hanford Site is applying for an air operating permit, expected to be issued in 1998. A prevention of significant deterioration permit covers the airborne discharge of certain pollutants from Hanford facilities. Significant increases in allowed emissions require an approved modification of the permit. Air permitting regulatory approvals must be obtained prior to constructing or modifying facilities that emit regulated pollutants. To date, 29 approvals have been obtained from the Washington State Department of

Ecology, 146 from the Washington State Department of Health, and 95 from the EPA. These numbers change as a result of continuing activities that require air permitting. The regulatory authority differs for each agency.

The sitewide and 300 Area Treated Effluent Disposal Facility pollutant discharge elimination system permits govern liquid process effluent discharges to the Columbia River. Stormwater discharges to the Columbia River are permitted by the National Pollutant Discharge Elimination System. Waste discharge permits are required by

WAC 173-216. These permits are summarized in Section 2.2.7.1, "Liquid Effluent Consent Order."

Other Hanford Site permitting addressed in the permitting status report (DOE/RL-96-63, Rev. 1) includes research, development, and demonstration; solid waste handling; onsite sewage systems; and permitting of underground petroleum storage tanks. Also refer to Appendix C, Table C.6.