

## 2. Environmental Compliance

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It is DOE-ORO and DOE National Nuclear Security Administration (DOE-NNSA) policy to conduct its operations in compliance with federal, state, and local environmental protection laws, regulations, compliance agreements and decrees, settlement agreements, executive orders, DOE orders (as incorporated into the operating contracts), work smart standards, and best management practices. DOE and its contractors make every effort to conduct operations in compliance with the letter and intent of applicable environmental statutes. The protection of the public, personnel, and the environment is of paramount importance.

Except for the few instances of noncompliance discussed in this chapter, all ORR sites were in compliance with applicable environmental regulations in 2002.

Each site achieved a National Pollutant Discharge Elimination System permit compliance rate greater than 99.9% in 2002.

In 2002, all three ORR facilities operated in compliance with the regulatory dose limits of Tennessee Rule 1200-3-11-.08 (Emission Standards for Hazardous Air Pollutants for Radionuclides) and met its emission and test procedures.

No releases of reportable quantities of hazardous chemicals or asbestos were reported under the Comprehensive Environmental Response, Compensation, and Liability Act by any of the sites.

Several private businesses operate under leasing arrangements at the East Tennessee Technology Park under the DOE Reindustrialization Program. Lessees are accountable for complying with all applicable standards and regulations and for obtaining permits and licenses with local, state, and federal agencies as appropriate. Unless specified, lessee operations are not discussed in this report.

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### 2.1 INTRODUCTION

DOE's operations on the reservation are required to be in conformance with environmental standards established by a number of federal and state statutes and regulations, executive orders, DOE orders, contract-based standards, and compliance and settlement agreements. However, numerous facilities at the ETTP site have been leased to private entities over the past several years through the DOE Reindustrialization Program. The lessees are separate and distinct from DOE and obtain their own permits. The lessees' compliance activities are not reflected in this report.

Principal among the regulating agencies are the U.S. Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC). These agencies issue permits, review compliance reports, participate in joint monitoring programs, inspect facilities and operations, and oversee compliance with applicable regulations.

When environmental issues are identified during routine operations or during ongoing self-assessments of compliance status, the issues are typically discussed with the regulatory agencies.

In the following sections, major environmental statutes are summarized for the ORR sites.

### 2.2 COMPLIANCE ACTIVITIES

#### 2.2.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was passed in 1976 to address management of the country's huge volume of solid waste. The law requires that EPA regulate the management of hazardous waste, which includes waste solvents, batteries, and many other substances deemed potentially harmful to human health and to the environment. RCRA also regulates underground storage tanks (USTs) used to store petroleum and hazardous substances; recyclable used oil; and batteries, mercury thermostats, selected pesticides, and fluorescent/ hazardous-waste lamps as universal wastes.

Subtitle C of RCRA controls all aspects of the management of hazardous waste, from the point of generation to treatment, storage, disposal, and recycle (TSDR). Hazardous waste generators must follow specific requirements for handling these

wastes. In addition, owners and operators of hazardous waste management facilities have operating and/or postclosure care permits.

Y-12, ORNL, and ETTP are considered RCRA large-quantity generators. Each generates both RCRA hazardous waste and RCRA hazardous waste containing or contaminated with radionuclides (mixed waste). The hazardous and/or mixed wastes are accumulated by individual generators at locations referred to as satellite accumulation areas or 90-day accumulation areas, as appropriate, where they are picked up by waste management personnel and transported to a TSDR facility or shipped directly off site for treatment, storage, or disposal. At the end of 2002, Y-12 had 136 generator accumulation areas for hazardous or mixed waste. ORNL had 349 generator accumulation areas, and ETTP maintained 17.

The Union Valley Sample Preparation Facility is also a large-quantity generator. At the end of 2002, this facility had nine satellite accumulation areas and one 90-day accumulation area.

ORISE is classified under RCRA as a conditionally exempt small-quantity generator. Its site accumulation area is located in the Chemical Safety Building on the Scarboro Operations Site.

The Central Training Facility on Bear Creek Road, the Office of Secure Transportation (OST) Garage (formerly the Transportation Safeguards Division Garage), ORNL's Walker Branch Watershed Laboratory and the National Transportation Research Center, and the Freer's Bend area are also classified as conditionally exempt small-quantity generators. In April 2002, ORNL requested that Walker Branch Watershed Laboratory's EPA Identification (ID) number be eliminated and to let them be under ORNL's EPA ID number as a large-quantity generator. TDEC approval was granted in April 2002.

Y-12 is registered as a large-quantity generator and a TSDR facility under EPA ID Number TN3890090001. Most of the units at the Y-12 Complex are being operated under operating permits; however, two units still operate under interim status in accordance with a Part A permit application. Six RCRA Part B permit applications have been submitted for storage and treatment units at the Y-12 Complex. Four Part B applications have been approved and issued as RCRA operating permits (Table 2.1). One application has been withdrawn because the unit (Interim

Reactive Waste Treatment Unit) was closed in 1997. One application has not been acted on.

The first Y-12 permit (TNHW-032) was issued by TDEC in 1994 for tank and container storage units (commonly referred to as OD-7, OD-9, and OD-10). These units were closed in 2001 and 2002, and on November 13, 2002, DOE requested that the permit be terminated. In 1995, TDEC issued permit TNHW-083 for container storage units and permit TNHW-084 for production-associated units. In 1996, TDEC issued permit TNHW-092 for the production and storage of classified waste.

These permits are modified whenever a change occurs to the area. During 2002, TNHW-084 was modified four times to update increased storage capacities, facility drawings, and the RCRA contingency plan. During 2002, TNHW-083 and TNHW-092 were each modified once to update the RCRA contingency plan.

ORNL is registered as a large-quantity generator and a TSDR facility under EPA ID Number TN1890090003. ORNL's most recent Part A revision (on July 14, 1999) included 33 units. During most of 2002, 23 units operated as interim-status or permitted units; another 7 units were proposed (new construction). Closure of one unit that was initiated in late 2001 was completed in 2002. By the end of 2002, ORNL had closed a total of 15 RCRA units. Information on two proposed units was, however, requested to be removed via a modification of Permit No. TNHW-097 submitted in 2002; approval was granted in late 2002. Information on two previously closed units was removed via modification of Permit No. TNHW-010A in 2002.

ORNL's RCRA units operate under three permits, TNHW-097, TNHW-010A, and TNHW-010; TNHW-010 is the existing RCRA Hazardous and Solid Waste Amendments (HSWA) permit for the ORR (see Table 2.1). The early termination of Permit No. TNHW-027 was approved in June 2002.

In July 2002, ORNL self-disclosed the presence of nonconforming items in ten solid low-level waste containers at ORNL. TDEC decided to not pursue enforcement of this issue in their response issued in October 2002.

ETTP is registered as a large-quantity generator and a TSDR facility under EPA ID Number TN0890090004. ETTP has received three

**Table 2.1. Resource Conservation and Recovery Act  
operating permits, 2002**

Permit number	Building/description
<b>Y-12 Complex</b>	
TNHW-032	Building 9811-1 Tank Storage Unit (OD-7) (closed 2002) Waste Oil/Solvent Storage Unit (OD-9) (closed 2001) Liquid Organic Solvent Unit (OD-10) (closed 2001)
TNHW-083	Building 9720-9 Container Storage Unit Building 9720-25 Container Storage Unit Building 9720-31 Container Storage Unit Building 9720-58 Container Storage Unit (closed 2002) Building 9811-1 Container Storage Unit (closed 2002) Portable Buildings 1 & 2 Container Storage Unit
TNHW-084	Building 9206 Building 9212 Building 9720-12 Cyanide Treatment and Storage Unit Organic Handling Unit
TNHW-092	Building 9720-32 Building 9720-59
<b>ORNL</b>	
TNHW-010	Hazardous and Solid Waste Amendments only
TNHW-010A	Building 7507 Container Storage Unit (removed 2002) Building 7507W Container Storage Unit Building 7651 Container Storage Unit Building 7652 Container Storage Unit <sup>a</sup> Building 7653 Container Storage Unit Building 7654 Container Storage Unit Building 7669 Container Storage Unit Building 7934 Container Storage Unit (removed 2002) Portable Buildings 1 & 2 Container Storage Unit
TNHW-027	Tank 7830A Storage Unit (permit terminated 2002)
TNHW-097	Building 7572 Container Storage Unit Building 7574 Container Storage Unit Building 7576 Container Storage Unit Building 7577 Container Storage Unit Building 7578 Container Storage Unit (removed 2002) Building 7579 Container Storage Unit (removed 2002) Building 7580 Container Storage Unit Building 7823 Container Storage Unit Building 7824 Container Storage Unit Building 7842 Container Storage Unit Building 7855 Container Storage Unit Building 7878 Container Storage Unit Building 7879 Container Storage Unit Building 7883 Container Storage Unit Building 7884 Container Storage Unit
<b>ETTP</b>	
TNHW-015	K-1435 Toxic Substances Control Act Incinerator
TNHW-015A	K-1425 and K-1435 Container and Tank Storage Units
TNHW-056	Container Storage Units and Waste Pile Units (26 storage units closed in 2001)

<sup>a</sup>Incorporated May 1997; originally under TN1890090003 (TNHW-010) up to May 1997.

RCRA permits (see Table 2.1). The K-1435 Toxic Substances Control Act (TSCA) Incinerator is a hazardous waste treatment unit operating under a RCRA permit (TNHW-015) issued by TDEC on September 28, 1987. A revised RCRA permit based on trial-burn results was received in December 1995. A reapplication of this permit was submitted to TDEC in March 1997. A second permit (TNHW-015A) is for storage of waste at the incinerator. Permit TNHW-056 covers container storage at various locations throughout the plant.

A RCRA Part B Permit Renewal Application to renew Permit No. TNHW-056 was prepared and submitted in April 2002. A Temporary Authorization was also submitted at this time to update the contingency plan and modify secondary containment language during TDEC review of the renewal application.

**2.2.1.1 RCRA Assessments, Closures, and Corrective Measures**

The HSWAs to RCRA, passed in 1984, require any facility seeking a RCRA permit to identify, investigate, and (if necessary) clean up all former and current solid waste management units. The original HSWA permit (HSWA TN-001) for the ORR was issued by the EPA as an attachment to the RCRA permit for Building 7652 at ORNL. The HSWA permit requires DOE to address past, present, and future releases of hazardous constituents to the environment. The HSWA permit requirement for corrective action has been integrated into the ORR Federal Facility Agreement (see Sect. 2.2.2 for details). In March 1998, EPA and TDEC issued separate drafts of the HSWA permit for DOE review and comment. EPA's was issued as a stand-alone permit; TDEC's was issued as a modification to a Y-12 postclosure permit. DOE submitted comments on the draft permits; however, comment resolution is still pending.

The renewed permit will address contaminant releases from solid waste management units and from RCRA areas of

concern, but will also integrate RCRA requirements with cleanups conducted under the Federal Facility Agreement and CERCLA programs (see Sect. 2.2.3). "Areas of concern" are areas contaminated by a release of hazardous constituents that originated from something other than a solid waste management unit. Under the existing HSWA permit, DOE must notify EPA within 30 days of identification of a new solid waste management unit or of planned significant changes to units that could alter further investigation or corrective action. DOE has provided to EPA the *2002 Annual Update of the Solid Waste Management Units for the Oak Ridge Reservation* (DOE 2002a) (see Table 2.2). The renewed permits (TDEC and EPA versions) have not yet been issued.

At Y-12, 34 RCRA units have been closed since the mid-1980s. Three permitted units, the Building 9811-1 Tank Storage Unit (OD-7), Building 9811-1 Container Storage Unit, and Building 9720-58 Container Storage Unit, were certified closed in 2002.

Since the mid-1980s, ORNL has closed a total of 15 RCRA units. ORNL's Solid Waste Storage Area (SWSA) 6 is an interim-status disposal site (landfill) that underwent partial closure beginning in late 1988. Although a revised closure plan for SWSA 6 (which included the eight interim-measure caps, the Hillcut Test Facility, and the Former Explosives Detonation Trench) was submitted in July 1995, actual final remediation of SWSA 6 has been deferred to CERCLA. The Melton Valley Record of Decision, which includes the selected remedy under CERCLA for SWSA 6, was signed in September 2000. A post-closure permit application for SWSA 6 was

**Table 2.2 Summary of 2002 annual update of ORR solid waste management units (SWMUs)**

Revision <sup>a</sup>	Number of sites/revisions
Additional information/revisions made to SWMUs	11
Addition of SWMUs to A-1(a) list	8
SWMUs/areas of contamination moved from A-1(a) to A-2	19
SWMUs/areas of contamination moved from A-2 to A-1(a)	14

<sup>a</sup>U.S. Department of Energy. 2002a. *Annual Update of the Solid Waste Management Units for the Oak Ridge Reservation*. Submitted to the U.S. Environmental Protection Agency.

submitted to TDEC in September 2002; issuance of the post-closure permit is pending.

At ETTP, the RCRA closure of the K-25 Vault K-301-2 and the Transportable Vitrification System was completed. The only remaining RCRA-permitted vault in the K-25 Building is K-309-2A. RCRA Units K-1025C, K-1036A, and K-711 are slated for closure in FY 2003 and FY 2004. All other cleanup actions at ETTP are being conducted under CERCLA.

RCRA assessments conducted by TDEC at the facilities resulted in four notices of violations (NOVs) issued in 2002. At Y-12, there were two NOVs; at ORNL, there were no NOVs; and at ETTP, there were two NOVs. Details of the violations are presented in Sect. 2.5.

### 2.2.1.2 Land Disposal Restrictions

The 1984 RCRA amendments established land disposal restrictions, which prohibited the land disposal of untreated hazardous wastes. The amendments require that all untreated wastes meet treatment standards before land disposal or that they be disposed of in a land disposal unit from which there will be no migration of hazardous constituents for as long as the waste remains hazardous. These restrictions also prohibit storage of restricted hazardous or mixed waste except as necessary to facilitate recovery, treatment, or disposal. Because treatment and disposal capacity for mixed wastes was unavailable for many years, DOE's storage of those mixed wastes over a year constituted RCRA land disposal restriction viola-

tions. To become compliant with RCRA, DOE entered into agreements with EPA, and later, with TDEC (see Sect. 2.2.4).

### 2.2.1.3 RCRA Subtitle D Solid Waste

Located within the boundary of the Y-12 Complex are two Class II operating industrial solid waste disposal landfills and one operating Class IV construction demolition landfill. These facilities are permitted by TDEC and accept solid waste from DOE operations on the ORR. A second Class IV construction demolition landfill (Landfill VI) is closed pending certification. In addition, one Class IV facility (Spoil Area 1) is overfilled by 11,700 yd<sup>3</sup> and has been the subject of a CERCLA remedial investigation/feasibility study. A CERCLA record of decision for this unit was signed in 1997. One Class II facility (Landfill II) has been closed and is subject to postclosure care and maintenance. Associated TDEC permit numbers are noted in Table 2.3.

### 2.2.1.4 RCRA Underground Storage Tanks

USTs containing petroleum and hazardous substances are regulated under Subtitle I of RCRA, 40 CFR 280. TDEC has been granted authority by EPA to regulate USTs containing petroleum under TDEC Rule 1200-1-15; however, hazardous-substance USTs are still regulated by

**Table 2.3. RCRA Subtitle D landfills, 2002<sup>a</sup>**

Facility	TDEC Permit Number	Comments
Industrial Landfill IV	IDL-01-103-0075	Operating, Class II
Industrial Landfill V	IDL-01-103-0083	Operating, Class II
Construction and Demolition Landfill	DML-01-103-0012	Overfilled, Class IV Subject of CERCLA record of decision
Construction and Demolition Landfill VI	DML-01-103-0036	Closed (pending certification), Class IV
Construction and Demolition Landfill VII	DML-01-103-0045	Operating, Class IV
Centralized Industrial Landfill II	IDL-01-103-0189	Postclosure care and maintenance

<sup>a</sup>Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation

EPA. Table 2.4 summarizes the status of USTs on the ORR.

ORNL has responsibility for 54 USTs registered with TDEC under Facility ID Number 0-730089. These 54 USTs can be classified as follows: 49 USTs closed to meet the RCRA Subtitle I requirements; 3 USTs in service that meet the 1998 standards for new UST installations; 2 USTs still in service that are deferred or exempt from Subtitle I because they are regulated by other statutes [one UST under the RCRA Subtitle C and one UST under the Clean Water Act (CWA)]. Of the 49 closed USTs, 24 were replaced by double-walled, concrete-encased aboveground storage tanks; 3 were replaced by the new, state-of-the-art USTs; and 22 were not replaced because they were no longer needed. Closure approval letters have been received for all USTs closed between 1988 and 1998.

The Y-12 UST Program includes four active petroleum USTs that meet all current regulatory compliance requirements. Two of these are located at the OST garage. The UST registration certificates for these tanks are current, and certificates are posted at the UST locations, enabling fuel delivery until March 31, 2004.

All legacy petroleum UST sites at Y-12 have either been granted final closure by TDEC or have been deferred to the CERCLA process for further investigation and remediation.

The ETTP UST Program includes two active petroleum USTs that meet all current regulatory compliance requirements. The UST registration certificates are updated annually and are conspicuously posted in accordance with TDEC rules. Fourteen other petroleum USTs have been removed or closed in place with TDEC regulators' recommendation of "case closed" status.

Five hazardous substance USTs at ETTP have been removed since 1996. One other hazardous substance UST designed as a spill overflow tank is present at ETTP but has never been activated.

Sixteen known and/or suspected historical USTs that were out of service before January 1, 1974, are also included in the ETTP UST Program as a best management practice. These historical UST sites could be subject to closure requirements if directed by UST regulators. Magnetic and electromagnetic geophysical techniques are being used for detection and characterization of these historical UST sites and other underground

**Table 2.4. ORR underground storage tank (UST) status, 2002**

	Y-12 Complex	ORNL	ETTP
Active/in-service	4 <sup>a</sup>	3	2
Closed	40	51 <sup>b</sup>	14
Hazardous substance	3 <sup>c</sup>	0 <sup>d</sup>	6
Known or suspected sites	0	0	16
Total	47	54	38

<sup>a</sup>Two are located off the Y-12 Complex at the Office of Secure Transportation garage.

<sup>b</sup>The 51 "closed" USTs include deferred or excluded tanks of various categories, as detailed in the text.

<sup>c</sup>Two USTs are deferred because they are regulated by the Atomic Energy Act of 1954. The third is a permanently closed methanol UST.

<sup>d</sup>Closed tanks include two hazardous substance tanks, both of which were excavated, removed, and dismantled.

<sup>e</sup>Four USTs were permanently closed that had been used to store natural gas odorant and are regulated under the Pipeline Safety Act. A fifth UST, designed as a spill-overflow tank, has never permanently been placed into service. A sixth UST, which stored a methanol-gasoline mixture, was permanently closed.

structures to provide property database information for reindustrialization of ETTP.

A detailed description of all ORNL, Y-12, and ETTP USTs and their status is included in Appendix C of the CY 2000 *Annual Site Environmental Report* (ASER) (DOE 2001d).

## 2.2.2 Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, also known as Superfund, was passed in 1980 and was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). Under CERCLA, a site is investigated and remediated if it poses significant risk to health or the environment. The EPA National Priorities List is a comprehensive list of sites and facilities

that have been found to pose a sufficient threat to human health and/or the environment to warrant cleanup under CERCLA. The ORR was placed on the National Priorities List in December 1989, ensuring that the environmental impacts associated with past and present activities at the ORR are thoroughly investigated and that appropriate remedial actions or corrective measures are taken as necessary to protect human health and the environment. An interagency agreement, known as the ORR Federal Facility Agreement, under Section 120(c) of CERCLA was signed in January 1991 by EPA, TDEC, and DOE. This agreement establishes the procedural framework and schedule for developing, implementing, and monitoring response actions on the ORR in accordance with CERCLA. Appendix C of the Federal Facility Agreement lists all of the sites/areas that will be investigated, and possibly remediated, under CERCLA. Milestones for completion of CERCLA documents are available in Appendix E of the agreement.

The progress toward achieving these goals is described in the *2003 Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE 2003a). This report describes the individual remedial actions and provides an overview of some of the monitoring conducted to evaluate the efficacy of those actions.

### 2.2.3 RCRA-CERCLA Coordination

The CERCLA response action and RCRA corrective action processes are similar and include

four steps with similar purposes (Table 2.5). The ORR Federal Facility Agreement is intended to coordinate the corrective action processes of RCRA required under the HSWA permit with CERCLA response actions.

As a further example, three RCRA post-closure permits, one for each of the three hydrogeologic regimes at Y-12, have been issued to address the seven major closed waste disposal areas at Y-12. Because it falls under the jurisdiction of two postclosure permits, the S-3 Pond Site is described as having two parts (east and west). (see Table 2.6). Groundwater corrective actions required under the postclosure permits have been deferred to CERCLA. Reporting of groundwater monitoring data will comply with RCRA post-closure permit conditions as well as with CERCLA requirements.

### 2.2.4 Federal Facility Compliance Act

In June 1992, DOE negotiated a federal facility compliance agreement with EPA and established the initial requirements for treating mixed wastes stored on the reservation. Later, on October 6, 1992, the Federal Facility Compliance Act was signed by Congress to bring federal facilities (including those under DOE) into full compliance with RCRA. The Federal Facility Compliance Act waives the government's sovereign immunity, allowing fines and penalties to be imposed for RCRA violations at DOE facilities. In addition, the act requires that DOE facilities provide comprehensive data to EPA and state regulatory agencies on mixed-waste inven-

**Table 2.5. Resource Conservation and Recovery Act (RCRA) corrective action processes and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions**

RCRA	CERCLA	Purpose
RCRA facility assessment	Preliminary assessment/site investigation	Identify releases needing further investigation
RCRA facility investigation	Remedial investigation	Characterize nature, extent, and rate of contaminant releases
Corrective measures study	Feasibility study	Evaluate and select remedy
Corrective measures implementation	Remedial design/remedial action	Design and implement chosen remedy

**Table 2.6. RCRA postclosure status for former treatment, storage, and disposal (TSD) units at Y-12**

Unit	Major components of closure	Major postclosure requirements
<b>Upper East Fork Poplar Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-089)</b>		
New Hope Pond	Engineered cap, Upper East Fork Poplar Creek distribution channel	Cap inspection and maintenance. No current groundwater monitoring requirements in lieu of ongoing CERCLA actions in the eastern portion of Y-12
Eastern S-3 Ponds Groundwater Plume	None for groundwater plume, see former S-3 Ponds (S-3 Site) for source area closure	Postclosure corrective action monitoring. Inspection and maintenance of monitoring network
<b>Chestnut Ridge Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-088)</b>		
Chestnut Ridge Security Pits	Engineered cap	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Kerr Hollow Quarry	Waste removal, access controls	Access controls inspection and maintenance. Postclosure detection monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Chestnut Ridge Sediment Disposal Basin	Engineered cap	Cap inspection and maintenance. Postclosure detection monitoring. Inspection and maintenance of monitoring network and survey benchmarks
<b>Bear Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-087)</b>		
Former S-3 Ponds (S-3 Site)	Neutralization and stabilization of wastes, engineered cap, asphalt cover	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Oil Landfarm	Engineered cap	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Bear Creek Burial Grounds A, B, and Walk-In Pits	Engineered cap, leachate collection system specific to the burial grounds	Cap inspection and maintenance. Post-closure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks.



ories, treatment capacities, and treatment plans for each site. It ensures that the public will be informed of waste treatment options and encourages active public participation in the decisions affecting federal facilities. TDEC is the authorized regulatory agency under the act for the DOE facilities in the state of Tennessee. The 1992 agreement was replaced in 1995 with a state commissioner's order. The Tennessee commissioner's order, signed on September 26, 1995, culminated negotiations between DOE and the state and established a site treatment plan to address treatment and disposal of DOE's mixed waste from Oak Ridge facilities.

The ORR Site Treatment Plan calls for low-level waste on the ORR to be treated by a combination of commercial treatment capabilities and existing and modified on-site treatment facilities. Mixed transuranic waste streams on the ORR, composed of both contact- and remote-handled wastes, will be treated in the Transuranic Processing Facility only as necessary to meet the waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP). Construction of the Transuranic Processing Facility began in the spring of 2001.

The ORR Site Treatment Plan provides overall schedules, milestones, and target dates for achieving compliance with land disposal restrictions; a general framework for the establishment and review of milestones; and other provisions for implementing the plan that are enforceable under the commissioner's order.

Semiannual progress reports document the quantity of land-disposal-restriction mixed waste in storage at the end of the previous six-month period and the estimated quantity to be placed in storage for the next five fiscal years. All milestones and commitments for the ORR Site Treatment Plan were met for CY 2002. The annual update of the plan has been issued for CY 2002.

The Site Treatment Plan will terminate when there is no land-disposal-restriction mixed waste in noncompliant storage (i.e., in storage for more than 1 year). In the absence of the plan, land-disposal-restriction mixed waste in storage for more than 1 year would be in violation of RCRA Section 3004(j).

## 2.2.5 National Environmental Policy Act

The National Environmental Policy Act (NEPA) provides a means to evaluate the potential environmental impact of proposed federal activities and to examine alternatives to those actions. The NEPA review process results in the preparation of NEPA documents in which federal, state, and local environmental regulations and DOE orders applicable to the environmental resource areas must be considered. These environmental resource areas include air, surface water, groundwater, terrestrial and aquatic ecology, threatened and/or endangered species, land use, and environmentally sensitive areas. Environmentally sensitive areas include floodplains, wetlands, prime farm land, habitats for threatened and/or endangered species, historic properties, and archaeological sites. Each ORR site NEPA program maintains compliance with NEPA through the use of its site-level procedures and program descriptions. These procedures and program descriptions assist in establishing effective and responsive communications with program managers and project engineers to establish NEPA as a key consideration in the formative stages of project planning. Table 2.7 notes the types of NEPA activities conducted at the ORR during 2002.

During 2002, ORNL operated under a procedure that provided requirements for project reviews and compliance with NEPA. It called for review of each proposed project, activity, or facility for its potential to result in significant impacts to the environment. To streamline the NEPA review and documentation process, DOE-ORO approved "generic" categorical exclusions for the ORNL Engineering Science and Technology Division, Computer Science and Mathematics Division, Computational Science and Engineering Division, and the Nuclear Science and Technology Division that would cover proposed bench- and pilot-scale research activities. This brings the total number of divisional-level generic categorical exclusions in use at ORNL to eleven. A categorical exclusion is one of a category of actions defined in 40 CFR 1508.4 that does not individually or cumulatively

**Table 2.7. National Environmental Policy Act (NEPA) activities during 2002**

Types of NEPA documentation	Y-12 Complex	ORNL	ETTP	ORR
Categorical exclusion (CX) recommendation	27, 2 <sup>a</sup>	11, 2 <sup>a</sup> , 2 <sup>b</sup>	0	
Specific CX granted	27, 2 <sup>a</sup>	11, 2 <sup>a</sup> , 2 <sup>b</sup>	0	
Approved under general CX documents	100, 1 <sup>a</sup>	59, 4 <sup>a</sup>	29	
Environmental assessment (EA)				0.08
EA determination				
Special EA				
Programmatic EA				
Supplemental analysis		1 <sup>c</sup>		
Environmental impact statement (EIS)				
Supplemental EIS				
Programmatic EIS				

<sup>a</sup>Bechtel Jacobs Company LLC.

<sup>b</sup>Wackenhut Services, Inc.

<sup>c</sup>A site-wide environmental impact statement for operations of the Y-12 Complex was issued in September 2001. This supplemental analysis addresses the construction of the Y-12 Special Material Capability Program Purification Facility.

have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is normally required. In addition to NEPA compliance reviews for a variety of projects that were not covered by generic categorical exclusions (Table 2.7), other NEPA reviews covered routine maintenance actions, laboratory and office renovation and upgrades, and site characterization activities. Two project-specific categorical exclusions (Pine Trees Removal in Firearms Tactical Area and New Training Facilities) were prepared for the Training and Emergency Management Department of Wackenhut Services, Inc. In addition, job-specific categorical exclusions were prepared by Bechtel Jacobs Company LLC (BJC) and were approved in 2002 for the RCRA Closure of Building 7823 at ORNL and Restart of Transuranic Waste Storage in Building 7934 at ORNL.

DOE implemented the Facilities Revitalization Project at ORNL, and groundbreaking activities for the various infrastructures (e.g., parking lots, utilities) have begun. The Facilities Revitalization Project is being accomplished through a cooperative effort between DOE, the state of Tennessee, and private entities. The goal of this collaboration is to upgrade ORNL's R&D capabilities, to ensure worker health and safety, and to reduce operating

costs and energy consumption. The Facilities Revitalization Project has been developed as a phased program. DOE drafted an environmental assessment to assess potential environmental impacts of the project, and the "finding of no significant impact" has been signed and issued (DOE 2001b). The proposed action alternative included upgrading existing facilities, constructing new facilities on brownfield sites, relocating ORNL staff from substandard facilities, and either maintaining deactivated facilities in a safe, "cheap-to-keep" mode or transferring them to the Environmental Management Program.

DOE has prepared a draft environmental assessment for the United States Enrichment Corporation Centrifuge Research and Development Project at ETTP.

Much of the NEPA activity at ETTP during 2002 continued to involve review of potential leases of the land and facilities. The *Final Environmental Assessment, Lease of Land and Facilities Within the East Tennessee Technology Park, Oak Ridge, Tennessee* (ORO 1997) was completed and approved in 1997 and was issued in December 1997 with a finding of no significant impact. The environmental assessment was written to describe the baseline environmental conditions at the site, to analyze potential generic impacts to the baseline environment from future tenant operations based on defined bounding

scenarios, and to identify and characterize cumulative impacts of future industrial uses of the site. In addition, the assessment provides DOE with environmental information for developing lease restrictions.

In 2002, NEPA reviews supported 24 potential lease actions as well as tenant modifications and improvements to facilities. Other NEPA reviews covered more routine maintenance actions, such as roof repairs, tree and underbrush removal, trailer removals, and gate installations. No job-specific categorical exclusions were prepared or approved in 2002 for ETTP.

At Y-12, 24 job-specific categorical exclusion documents were prepared and were approved in 2002 in support of the Infrastructure Reduction Program. The Infrastructure Reduction effort is focused on preparing the Y-12 Complex for modernization; during FY 2002 it reduced the Y-12 "footprint" by over 500,000 ft<sup>2</sup> by building demolition. In addition, job-specific categorical exclusions prepared by BJC were approved for the closure of Y-12 RCRA waste storage unit OD-8, container storage unit 9720-58, and the closure of Construction/Demolition Landfill VI. Other general NEPA categorical exclusion reviews covered routine actions, such as office renovations, improvements to security systems, equipment replacements, and infrastructure improvements. A total of 130 NEPA reviews were performed and approved in 2002.

In September 2001, DOE published the *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex* (DOE 2001c), which considers the environmental impacts of ongoing and proposed activities at Y-12. DOE expects that it will continue to support new projects and facilities for Y-12 (or that it will consider Y-12 as an alternative site for such facilities or activities). Such new proposals will be considered in programmatic or project-specific NEPA reviews, as appropriate, as they become ripe for analysis. Subsequent NEPA reviews for projects or activities at Y-12 will make reference to, and be tiered from, the EIS. In addition, specific analyses were presented for two proposals for new facilities and alternatives for the highly enriched uranium storage and the special materials missions at Y-12. The Preferred Alternative presented in the final site-wide environmental impact statement is to continue the

historic mission support operations at Y-12 and to construct and operate a new Highly Enriched Uranium Materials Facility and a new Special Materials Complex at Y-12.

In March 2002, DOE-NNSA issued the Record of Decision on the Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, which is the formal statement of the agency's decision on the proposed action evaluated in the environmental impact statement. The decision on the proposed Highly Enriched Uranium Materials Facility is construction of the new facility in the Y-12 West Portal Parking Lot. The record of decision deferred the decision on the location for construction of the Special Materials Complex pending completion of ongoing studies to reevaluate the special material mission and project configuration. The Special Materials Complex proposed in the environmental impact statement included a Beryllium Production Facility, a Purification Facility, a Manufacturing/Warehouse Facility, an Isostatic Press Facility, and a Core Support Facility.

The proposed Special Materials Capabilities Program Purification Facility is one of the requirement, configuration, and design preliminary studies associated with the Special Materials Complex. The proposed site for construction of the facility is at the former site of 9720-40, which was demolished in 2002 (just south of Second Street, east of Building 9204-1). This site was evaluated and is favored because of the existing utility infrastructure. It is located within the existing Y-12 Complex footprint. NNSA has completed a supplemental analysis (in accordance with 40 CFR 1500-1508 and 10 CFR 1021.314c) to provide the basis for the site selection and the determination of whether a supplemental environmental impact statement was required for construction and operation of the Purification Facility. The *Final Supplemental Analysis for Purification Facility Site-Wide Environmental Impact Statement for the Y-12 National Security Complex* (DOE 2002c) was approved and issued in August 2002. The supplemental analysis concludes that construction and operation of the Purification Facility at the proposed location would not result in potential environmental impacts significantly different from those analyzed for the Special Materials Complex in the Y-12 Site-Wide Environmental Impact

Statement. Changes in the impacts associated with proceeding with the Purification Facility project either reduce or do not affect the environmental impacts of the Special Materials Complex identified in the Preferred Alternative of the Y-12 Site-Wide Environmental Impact Statement.

The *Oak Ridge Reservation Environmental Impact Assessment for Transportation of Low-Level Radioactive Mixed Wastes from the Oak Ridge Reservation to Off-Site Treatment or Disposal Facilities* (DOE 2001e) was finalized during 2002. This environmental assessment evaluated the potential environmental impacts associated with transportation of legacy and operational low-level mixed waste from the reservation for treatment or disposal at various locations in the United States. The finding of no significant impact was signed by the DOE manager of Oak Ridge Operations on August 23, 2002.

The *Programmatic Environmental Impact Assessment for the U.S. Department of Energy, Oak Ridge Operations, Implementation of a Comprehensive Management Program for the Storage, Transportation, and Disposition of Potentially Reusable Uranium Materials* was finalized in 2002. The finding of no significant impact was signed by the DOE manager of Oak Ridge Operations on October 16, 2002. This programmatic environmental assessment implemented a comprehensive management program for DOE to safely, efficiently, and effectively manage its potentially reusable low enriched uranium, normal uranium, and depleted uranium. Uranium materials, which are presently located at multiple sites, would be consolidated by transporting the materials to one or several storage locations to facilitate ultimate disposition. Management would include the storage, transport, and ultimate disposition of these materials.

### 2.2.6 National Historic Preservation Act

In March 2003, President Bush signed Executive Order 13287, *Preserve America*, directing federal agencies to improve their management of historic properties and to foster heritage tourism in partnership with local communities. Section 106 of the National Historic Preservation Act (NHPA) requires that federal

agencies take into account the effects of their undertakings on properties included in or eligible for inclusion in the *National Register of Historic Places* (National Park Service 2002). To comply with Section 106 of the NHPA and its implementing regulations at 36 CFR 800, DOE-ORO was instrumental in the ratification of a programmatic agreement among DOE-ORO, the Tennessee state historic preservation officer, and the Advisory Council on Historic Preservation concerning management of historical and cultural properties on the ORR. The programmatic agreement was ratified on May 6, 1994, and has been incorporated into the approved *Cultural Resource Management Plan, DOE Oak Ridge Reservation* (DOE 2001a). The plan was completed in accordance with stipulations in the programmatic agreement, including historical surveys to identify significant historical properties on the ORR.

Compliance with NHPA at ORNL, Y-12, and ETTP is achieved and maintained in conjunction with NEPA compliance. The scope of proposed actions is reviewed in accordance with the *Cultural Resource Management Plan*. If warranted, consultation is initiated with the state historic preservation officer and the Advisory Council on Historic Preservation, and the appropriate level of documentation is prepared and submitted. A memorandum of agreement was signed by DOE-ORO (September 16, 2002) and the state historic preservation officer (September 30, 2002) for the demolition of ORNL buildings 2000, 2001, 3013, 3550, 9211, and 9743-2. Buildings 9211 and 9743-2 are ORNL-managed facilities that are located at the Y-12 site. A stipulation in the memorandum required ORNL to prepare and submit a site historic preservation plan and site-wide programmatic agreement to the state historic preservation officer and the Advisory Council within an 18-month period following the signing of the memorandum.

A memorandum of agreement was signed by NNSA and the state historic preservation officer on May 23, 2002, for the demolition of Y-12 Complex buildings 9205, 9208, 9404-7, 9418-6, 9610, 9620-2, 9720-1, 9720-2, 9723-4, and 9728. A stipulation in the memorandum required Y-12 to prepare and submit a site historic preservation plan and site-wide programmatic agreement to the state historic preservation officer and Advisory

Council within a 12-month period following the signing of the memorandum. The Historic Preservation Plan and the Site-Wide Programmatic Agreement is being developed and will be submitted to the state historic preservation officer and the Advisory Council in May 2003. Proposed demolition projects are on hold until the Site Historic Preservation Plan and Programmatic Agreement is approved by the state historic preservation officer and the Advisory Council. An amendment to the memorandum of agreement was signed by NNSA and the state historic preservation officer on August 15, 2002, for the demolition of Building 9770-1.

In March 2002, notification of a proposed undertaking to demolish two Environmental Management Program facilities located at the Y-12 National Security Complex (Buildings 9401-2 and 9735) was submitted to the Tennessee state historic preservation officer. A project summary and draft memorandum of agreement were submitted to the Tennessee state historic preservation officer for demolition of these two facilities, and the memorandum was approved and signed by DOE-ORO and the Tennessee state historic preservation officer in August 2002.

Y-12 projects were reviewed in accordance with the *Cultural Resource Management Plan*, which allowed the proposed projects to proceed without further Section 106 review because no historic properties were being adversely impacted.

ETTP was surveyed in 1994 to identify properties eligible for inclusion in the *National Register*. An archaeological survey was also completed at ETTP. Properties eligible for inclusion in the *National Register* include the ETTP Main Plant Historic District, which includes facilities within the main plant and contains 120 contributing structures, 37 non-contributing structures, and 11 structures that are not contiguous with the historic district. More detailed information on the properties eligible for inclusion in the *National Register* is provided in the *Cultural Resource Management Plan*.

In August 2002, DOE submitted a notification of adverse effect of a proposed undertaking for decontamination and decommissioning of properties located at the ETTP. The proposed project is to decontaminate and demolish or transfer all remaining properties located within the K-25 Site Main Plant and Powerhouse Historic Districts

located on the ORR in Roane County, Tennessee, as outlined in the Oak Ridge Comprehensive Closure Plan. The Tennessee state historic preservation officer, the Advisory Council, and other interested parties were invited to participate in the planning stages of the proposed undertaking and to enter into the consultation process. Consultation will begin in 2003 to develop a path forward, and a memorandum of agreement will be negotiated among the consulting parties. During 2002, consultation continued with the Advisory Council, the state historic preservation officer, and other consulting parties on the decontamination and decommissioning of the K-25 and K-27 Buildings to determine actions to avoid, minimize, or mitigate the adverse effects to these two historical properties. A draft memorandum of agreement was prepared and transmitted to all consulting parties, and consultation efforts will continue during 2003 to finalize the memorandum of agreement. Other ETTP projects were reviewed in accordance with the programmatic agreement or the *Cultural Resource Management Plan*, and no additional adverse effects to historical properties were identified that required notification to the state historic preservation officer.

A survey of all ORISE structures was conducted to comply with the NHPA. Only one structure currently under ORISE stewardship, the Atmospheric Turbulence and Diffusion Division Laboratory main building, was identified as being included in the *National Register*. All actions performed at that site conform to the programmatic agreement with the state historic preservation officer.

## 2.2.7 Protection of Wetlands

Executive Order 11990 (issued in 1977) was established to mitigate adverse effects to wetlands caused by their destruction or modification and to avoid construction in wetlands wherever possible. Avoidance of these effects is ensured through implementation of the sensitive-resource analysis conducted as part of the DOE NEPA review process. Protective buffer zones and application of best management practices are required for activities on the ORR. Coordination with TDEC, the U.S. Army Corps of Engineers, and sometimes TVA is necessary for activities involving waters of the United States and waters of the state, which

include wetlands and floodplains. Generally, this coordination results in permits from the Corps of Engineers, TVA, and/or the state of Tennessee (see Sect. 2.2.12.4 for permitting details). In addition, TDEC has developed a regulatory position on impacted wetlands that includes mitigation: affected wetlands must be replaced in area and function by restoration of disturbed wetlands, construction of wetlands, or enhancement of previously impacted areas.

The ORR implements protection of wetlands through each site's NEPA program in accordance with 10 CFR 1022, "Compliance With Floodplain/Wetlands Environmental Review Requirements." Each of the sites has also conducted surveys for the presence of wetlands and conducts surveys on a project- or program-as-needed basis. In the early to middle 1990s, an effort was initiated to conduct a wetlands survey of the entire reservation (LMES 1995). That effort was not completed, but it was reported in the 1995 ASER (LMER 1996) that wetland surveys and delineations were conducted on about 14,000 acres (5668 ha) of the 34,424 acres (13,968 ha) that made up the reservation. About 600 acres (243 ha) of wetlands were identified in the areas in which surveys were conducted. Since then, wetland surveys have been conducted on an as-needed basis.

Y-12 has conducted two surveys of its wetlands resources. *Identification and Characterization of Wetlands in the Bear Creek Watershed* (MMES 1993) was completed in October 1993, and a wetland survey of selected areas in the Y-12 Complex area of responsibility was completed in October 1994. The first report surveys the Y-12 Complex and surrounding areas; the second report, *Wetland Survey of Selected Areas in the Oak Ridge Y-12 Plant Area of Responsibility, Oak Ridge, Tennessee* (LMES 1997a), surveys additional areas for which restoration activities are planned.

A wetlands survey of ORNL areas, *Wetland Survey of the X-10 Bethel Valley and Melton Valley Groundwater Operable Units at Oak Ridge National Laboratory* (Rosensteel 1996), serves as a reference document to support wetlands assessments for upcoming ORNL projects and activities.

A wetland mitigation plan, *Project Description and Wetland Mitigation Plan, Spallation Neutron Source Bethel Valley Access Road,*

*Anderson County and Roane County, Tennessee* (SNS 2001), was developed in March 2000 as a result of projected impacts to a small wetland from the construction of the new SNS access road. In June 2000, TDEC issued an aquatic resources alteration permit for the project. The construction of the new road provided an opportunity to restore the original wetland and its natural hydrology, which had been negatively affected by the old Chestnut Ridge Road that crossed the area. Wetland mitigation activities, which included site grading and the planting of native wetland trees and shrubs, were largely completed in December 2000, with final seeding of the site with native wetland herbs in March 2001. As required by the aquatic resources alteration permit, annual monitoring is conducted and the results are reported to TDEC. The first annual report was submitted to TDEC in spring 2002. Monitoring results to date suggest that the wetland is on its way to being fully restored.

In late 2001 and early 2002, previously undesignated wetland areas within the ETTP area of responsibility were added to the ETTP wetland map. The map is updated as new information is obtained and is used so that construction crews, remediation project planners, and those involved in other operations will be aware of these sensitive areas.

Sensitive aquatic areas (wetlands, springs, and streams) were surveyed and flagged within the proposed tree-clearing zone adjacent to the K-161 power line right-of-way on December 16 and December 18, 2002. The area surveyed extends from Highway 95 to the Clinch River near the ETTP site. The flagging ensures that tree clearing activities do not negatively affect these sensitive areas.

## 2.2.8 Floodplains Management

Executive Order 11988 (issued in 1977) was established to require federal agencies to avoid to the extent possible adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Agencies must determine whether a floodplain is present that may be affected by an action, assess the impacts on such, and consider alternatives to the action. The

executive order requires that provisions for early public review and measures for minimizing harm be included in any plans for actions that might occur in the floodplain. Floodplain assessments and the associated notices of involvement and statements of findings are prepared in accordance with 10 CFR 1022, usually as part of the NEPA review and documentation process.

dictate that animal and plant species of concern be considered when a proposed project has the potential to alter their habitat or otherwise harm them. At the federal level, such species are classified as endangered, threatened, or species of concern. At the state level, these species are considered endangered, threatened, of special concern (plants), or in need of management (animals). All such species are termed “special concern” species in this report.

## 2.2.9 Endangered Species Act

Good stewardship, state laws (“The Rare Plant Protection and Conservation Act of 1985,” Tennessee Code Annotated Section 70-8-301 to 314, and “Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974,” Tennessee Code Annotated Section 70-8-101 to 110), and federal laws (“Endangered Species Act of 1973,” 16 U.S.C. 1531 et seq.)

### 2.2.9.1 Special Concern Animals

Listed animal species known to be present on the reservation (excluding the Clinch River bordering the reservation) are given along with their status in Table 2.8. The list illustrates the diversity of birds on the ORR, which is also habitat for many unlisted species, some of which

**Table 2.8. Animal species of concern reported from the Oak Ridge Reservation (ORR)<sup>a</sup>**

Species	Legal status <sup>b</sup>	
	Federal	State
<b>Fish</b>		
<i>Phoxinus tennesseensis</i>	Tennessee dace	NM
<b>Amphibians and reptiles</b>		
<i>Hemidactylium scutatum</i>	Four-toed salamander	NM
<b>Birds</b>		
<i>Accipiter striatus</i>	Sharp-shinned hawk	NM
<i>Anhinga anhinga</i>	Anhinga	NM
<i>Casmerodius alba</i>	Great egret	NM
<i>Circus cyaneus</i>	Northern harrier	NM
<i>Contopus borealis</i>	Olive-sided flycatcher	NM
<i>Dendroica cerulea</i>	Cerulean warbler	C NM
<i>Egretta caerulea</i>	Little blue heron	NM
<i>Egretta thula</i>	Snowy egret	NM
<i>Falco peregrinus<sup>c</sup></i>	Peregrine falcon	E
<i>Haliaeetus leucocephalus<sup>d</sup></i>	Bald eagle	T NM
<i>Lanius ludovicianus</i>	Loggerhead shrike	NM
<i>Pandion haliaetus</i>	Osprey	E
<i>Pooecetes gramineus</i>	Vesper sparrow	NM
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker	NM
<i>Tyto alba</i>	Common barn owl	NM
<b>Mammals</b>		
<i>Myotis grisescens</i>	Gray bat	E E
<i>Sorex longirostris</i>	Southeastern shrew	NM

<sup>a</sup>Land and surface waters of the ORR exclusive of the Clinch River, which borders the ORR.

<sup>b</sup>E = endangered, T = threatened, C = species of concern, NM = in need of management.

<sup>c</sup>The peregrine falcon was federally delisted on August 25, 1999.

<sup>d</sup>The bald eagle was proposed for federal delisting on July 6, 1999.

are in decline nationally or regionally. Other listed species may also be present, although they have not been observed recently. These include several species of mollusks (such as the spiny riversnail), amphibians (such as the hellbender), birds (such as Bachman's sparrow), and mammals (such as the smoky shrew). Birds, fish, and aquatic invertebrates are the most thoroughly surveyed animal groups on the ORR. The only federally listed animal species that have been recently observed (e.g., the gray bat) are represented by one to several migratory or transient individuals, or bordering the ORR (e.g., the Clinch River), rather than by permanent residents, although this situation may change as these species continue to recover. The federally threatened bald eagle is increasingly seen in winter and may well begin nesting here within a few years. Similarly, several state-listed bird species, such as the anhinga, olive-sided flycatcher, double-crested cormorant, and little blue heron, are currently uncommon migrants or visitors to the reservation; however, the double-crested cormorant and little blue heron are probably increasing in numbers. Others, such as the cerulean warbler, northern harrier, great egret, and yellow-bellied sapsucker, are migrants or winter residents that do not nest on the reservation. The cerulean warbler is now regarded as a probable nesting bird. Two species have been sighted/collected in the City of Oak Ridge and are possibly present on the ORR: golden-winged warbler (*Vermivora chrysoptera*, state in need of management) and spotfin chub (*Cyprinella monnacha*, federal and state threatened).

### 2.2.9.2 Identification of Threatened Fish Species in East Fork Poplar Creek

In routine sampling associated with the Y-12 Biological Monitoring and Abatement Program (BMAP) of East Fork Poplar Creek on September 10, 2002, a spotfin chub (*Cyprinella monnacha*) was unexpectedly identified in lower East Fork Poplar Creek, approximately 4 km below the Y-12 National Security Complex. This fish species is listed as threatened by the U. S. Fish and Wildlife Service under the federal Endangered Species Act and is the first known presence of a threatened species of fish in East Fork Poplar Creek.

Notification to regulatory agencies (TWRA and the U.S. Fish and Wildlife Service) has been made in accordance with the Endangered Species Act. At this point it is uncertain whether the single fish discovered is a migrant from the closest known population in the Emory River or is a member of a previously undetected local population. The long-term ramifications of this discovery are also uncertain.

The presence of this fish, which is common only in certain habitats with good water quality, is another signal of continued recovery of East Fork Poplar Creek as pollution sources from Y-12 are eliminated and remediation efforts continue. East Fork Poplar Creek has been well surveyed since 1985, and continued gradual recovery of the aquatic community in the stream is well documented. Nonetheless, the discovery of the threatened spotfin chub was unexpected.

### 2.2.9.3 Threatened and Endangered Plants

There are currently 21 listed plant species on the ORR; among them are the pink lady's-slipper and Canada lily (Table 2.9). Two species occurring on the ORR, Carey's saxifrage and the purple fringeless orchid, have been removed from the state list as of November 17, 1999. Four species (spreading false-foxglove, Appalachian bugbane, tall larkspur, and butternut) have been under review for listing at the federal level and were listed under the formerly used "C2" candidate designation. These species are now informally referred to as "special concern" species by the U.S. Fish and Wildlife Service.

Two additional species listed by the state, the Michigan lily and the hairy sharp-scaled sedge, were identified in the past on the ORR; however, they have not been found in recent years. Another listed species, large-tooth aspen, was reported in two locations on the ORR in 2002. One of the reports was confirmed, but the tree died during the year. The other report has not yet been confirmed. Several state-listed plant species currently found on adjacent lands may be present on the ORR as well, although they have not been located (Table 2.10).



**Table 2.9. Currently known or previously reported vascular plant species from the Oak Ridge Reservation (ORR) that are listed by state or federal agencies, 2002**

Species	Common name	Habitat on ORR	Status code <sup>a</sup>
<i>Aureolaria patula</i>	Spreading false-foxglove	River bluff	C2, T
<i>Carex gravida</i>	Heavy sedge	Varied	S
<i>Carex oxylepis</i> var. <i>pubescens</i> <sup>b</sup>	Hairy sharp-scaled sedge	Shaded wetlands	S
<i>Cimicifuga rubifolia</i>	Appalachian bugbane	River slope	C2, T
<i>Cypripedium acaule</i>	Pink lady's-slipper	Dry to rich woods	E, CE
<i>Delphinium exaltatum</i>	Tall larkspur	Barrens and woods	C2, E
<i>Diervilla lonicera</i>	Northern bush-honeysuckle	River bluff	T
<i>Draba ramosissima</i>	Branching whitlow-grass	Limestone cliff	S
<i>Elodea nuttallii</i>	Nuttall waterweed	Pond, embayment	S
<i>Fothergilla major</i>	Mountain witch-alder	Woods	T
<i>Hydrastis canadensis</i>	Golden seal	Rich woods	S, CE
<i>Juglans cinerea</i>	Butternut	Slope near stream	C2, T
<i>Juncus brachycephalus</i>	Small-head rush	Open wetland	S
<i>Lilium canadense</i>	Canada lily	Moist woods	T
<i>Lilium michiganense</i> <sup>c</sup>	Michigan lily	Moist woods	T
<i>Liparis loeselii</i>	Fen orchid	Forested wetland	E
<i>Panax quinquefolius</i>	Ginseng	Rich woods	S, CE
<i>Platanthera flava</i> var. <i>herbiola</i>	Tuberculed rein-orchid	Forested wetland	T
<i>Populus grandidentata</i> <sup>d</sup>	Large-tooth aspen	Dry, woodlands	S
<i>Ruellia purshiana</i>	Pursh's wild-petunia	Dry, open woods	S
<i>Scirpus fluviatilis</i>	River bulrush	Wetland	S
<i>Spiranthes lucida</i>	Shining ladies-tresses	Boggy wetland	T
<i>Thuja occidentalis</i>	Northern white cedar	Rocky river bluffs	S
<i>Viola tripartita</i> var. <i>tripartita</i>	Three-parted violet	Rocky woods	S

<sup>a</sup>Status codes:

- C2 Special concern, under review for federal listing; listed under the formerly used C2 candidate designation. More information needed to determine status.
- E Endangered in Tennessee.
- T Threatened in Tennessee.
- S Special concern in Tennessee.
- CE Status due to commercial exploitation.

<sup>b</sup>*Carex oxylepis* var. *pubescens* has not been relocated during recent surveys.

<sup>c</sup>*Lilium michiganense* is believed to have been extirpated from the ORR by the impoundment at Melton Hill.

<sup>d</sup>*Populus grandidentata* was reported in two ORR locations. One of the reports was confirmed, but the tree died during the year.

## 2.2.10 Environmental Justice

On February 11, 1994, Executive Order 12898, *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*, was promulgated. The executive order requires that federal actions not have the effect of excluding, denying, or discriminating on the basis of race, color, national origin, or income level and that federal agencies must ensure that there are no disproportionate impacts from their actions on low-income and minority communities surrounding their facilities.

An Environmental Justice strategy is in place at DOE-ORO under the direction of the Diversity Programs Office. It addresses the need to communicate DOE activities effectively to minority communities. In addition, the interim scoping team involved in the review and editing of NEPA documents ensures that the language is presented in a manner that does not require stakeholders to possess a technical background for them to effectively participate in the decision-making process.

Planned DOE actions to be addressed under NEPA include an analysis of the health, envi-

**Table 2.10. Additional rare plants that occur near and could be present on the Oak Ridge Reservation (ORR), 2002**

Species	Common name	Habitat on ORR	Status code <sup>a</sup>
<i>Agalinis auriculata</i>	Earleaf false foxglove	Calcareous barren	C2, E
<i>Allium burdickii</i> or <i>A. tricoccom</i> <sup>b</sup>	Ramps	Moist woods	S, CE
<i>Berberis canadensis</i>	American barberry	Rocky bluff, creek bank	S
<i>Gnaphalium helleri</i>	Catfoot	Dry woodland edge	S
<i>Lathyrus palustris</i>	A vetch	Moist meadows	S
<i>Liatris cylindracea</i>	Slender blazing star	Calcareous barren	E
<i>Lonicera dioica</i>	Mountain honeysuckle	Rocky river bluff	S
<i>Meehania cordata</i>	Heartleaf meehania	Moist calcareous woods	T
<i>Pedicularis lanceolata</i>	Swamp lousewort	Calcareous wet meadow	T
<i>Pycnanthemum torreic</i>	Torrey's mountain-mint	Calcareous barren edge	S
<i>Solidago ptarmicoides</i>	Prairie goldenrod	Calcareous barren	E

<sup>a</sup>Status codes:

- C2 Special concern, under review for federal listing; was listed under the formerly used C2 candidate designation. More information needed to determine status.
- E Endangered in Tennessee.
- T Threatened in Tennessee.
- S Special concern in Tennessee.
- CE Status due to commercial exploitation.

<sup>b</sup>Ramps have been reported near the ORR, but there is not sufficient information to determine which of the two species is present or if the occurrence may have been introduced by planting. Both species of ramps have the same state status.

ronmental, economic, and demographic impacts of the planned action on surrounding minority and low-income communities that could be affected by the action.

### 2.2.11 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) of 1974 is an environmental statute for the protection of drinking water. This act requires EPA to establish primary drinking water regulations for contaminants that may cause adverse public health effects. Although many of the requirements of the SDWA apply to public water supply systems, Section 1447 states that each federal agency having jurisdiction over a federally owned or maintained public water system must comply with all federal, state, and local requirements regarding the provision of safe drinking water.

The city of Oak Ridge supplies potable water to Y-12 and ORNL. The Water Treatment Plant, located north of the Y-12 Complex, is owned by the city of Oak Ridge.

Y-12, ORNL, and ETPP perform certain monitoring activities, including free residual chlorine, bacteriological, and copper and lead

analyses. The Y-12 and ORNL potable water systems are classified as a nontransient, noncommunity water supply system by TDEC.

The Y-12 and ORNL distribution systems have qualified for triennial lead and copper sampling. The Y-12 distribution system was last sampled in 2002; the ORNL system was last sampled in 2000. All Y-12 and ORNL analyses were satisfactory. Lead and copper sampling is not planned again until 2003 at ORNL. In addition, the Y-12 and ORNL drinking water distribution system bacteriological sample analyses were satisfactory in 2002. ETPP monitors the levels of turbidity and of organic, inorganic, and radioactive contaminants in finished drinking water at its water plant. All test results during 2002 were satisfactory.

The TDEC Division of Water Supply performed a Sanitary Survey on the Y-12 Potable Water System in August 2002. TDEC noted that the city of Oak Ridge project to install a new potable water line to supply the industrial park east of the Y-12 Complex corrects a previously identified safe drinking water deficiency. The final grade for the Y-12 Potable Water System

was a 98 out of a possible 100, which classifies the water system as an “Approved” system

Y-12, ORNL, and ETTP have cross-connection prevention programs to prevent the contamination of potable water through the use of backflow preventers, engineering design, and physical separation. Backflow preventers that failed performance checks have been repaired, or the equipment served by the units has been taken out of service.

The K-1515 Sanitary Water Plant provides drinking water for ETTP and for an industrial park located on Bear Creek Road south of the site. The DOE-owned facility is classified by TDEC as a nontransient, noncommunity water supply system and is subject to state regulations. On April 1, 1998, operation of this leased facility became the responsibility of Operations Management International, Inc., under contract with CROET.

## 2.2.12 Clean Water Act

The objective of the CWA is to restore, maintain, and protect the chemical, physical, and biological integrity of the nation’s waters. With continued amendments, the CWA has established a comprehensive federal and state program to protect the nation’s waters from pollutants. Congress continues to work on amendments to and reauthorization of the CWA. (See Appendix C for reference standards and data for water.)

### 2.2.12.1 National Pollutant Discharge Elimination System

One of the strategies developed to achieve the goals of the CWA was EPA’s establishment of limits on specific pollutants allowed to be discharged to waters of the United States by municipal sewage treatment plants and industrial facilities. In 1972, the EPA established the National Pollutant Discharge Elimination System (NPDES) permitting program to regulate compliance with these pollutant limitations. The program was designed to protect surface waters by limiting effluent discharges into streams, reservoirs, wetlands, and other surface waters.

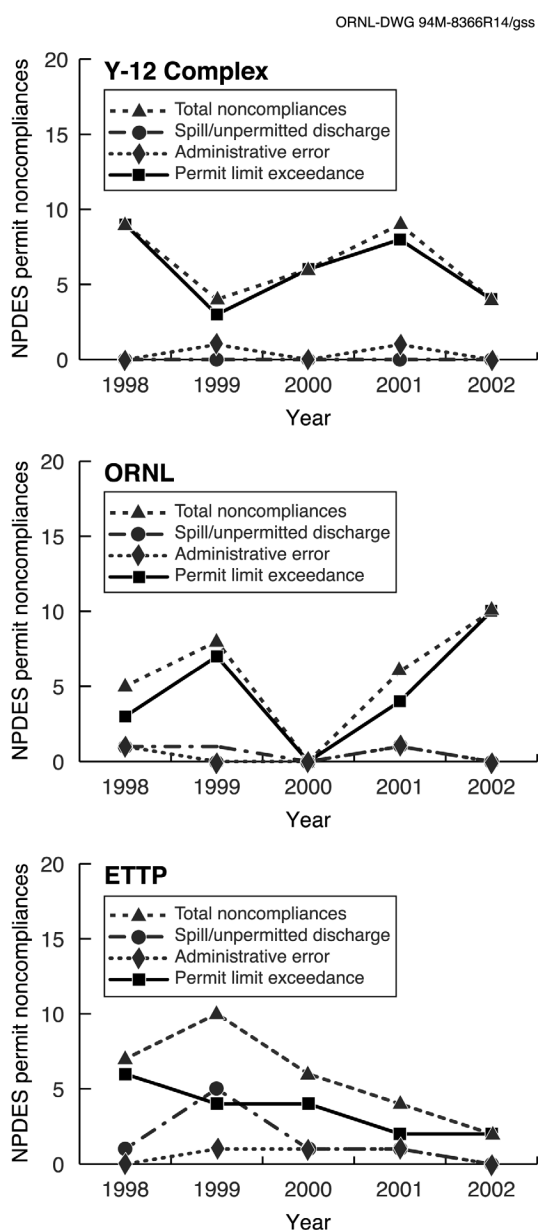
## Y-12 Complex

The current Y-12 Complex NPDES permit (TN0002968) became effective on July 1, 1995, and expired on April 28, 2000. In October 1999, a complete application for renewal of the Y-12 NPDES permit was submitted to the TDEC. Y-12 continues to operate under the existing 1995 permit until TDEC completes the renewal process. Presently, approximately 92 active point-source discharges or storm water monitoring locations are monitored for compliance with the permit. Monitoring resulted in approximately 9,520 laboratory analyses in 2002 in addition to numerous field observations. Monitoring of discharges demonstrates that the Y-12 Complex continues to achieve an NPDES permit compliance rate of nearly 100%. At the Y-12 Complex, there were four NPDES noncompliances in 2002 (Fig. 2.1). Information on these noncompliances is provided in Appendix D, Table D.1.

In September 1999, a consent order agreed to by DOE and the Tennessee Water Quality Board resolved the outstanding permit appeals regarding biotoxicity and mercury limitations in East Fork Poplar Creek. The requirements for in-stream mercury monitoring and limits were deleted from the NPDES permit and were placed under the CERCLA program. The current permit requires storm water characterizations at selected monitoring locations in accordance with the *Storm Water Pollution Prevention Plan for the Oak Ridge Y-12 Plant, Y/TS-1180/R4* (BWXT 2002). Other documents submitted to TDEC in accordance with the NPDES permit include the *Radio-logical Monitoring Plan* (revised in 1997) (LMES 1997b) and the *Oak Ridge Y-12 Plant Biological Monitoring and Abatement Program Plan* (revised in 2000) (Adams et al. 2000). A report on the analysis of fecal coliform bacteria levels at selected storm water monitoring points has been previously submitted.

## ORNL

ORNL is currently operating under NPDES Permit TN 0002941, which was renewed by TDEC on December 6, 1996, and went into effect February 3, 1997. A four-volume permit renewal application was submitted to TDEC and EPA in



**Fig. 2.1. Five-year summary of NPDES noncompliances.**

June 2001. The ORNL NPDES permit lists 164 point-source discharges and monitoring points that require compliance monitoring. Approximately 100 of these are storm drains, roof drains, and parking lot drains. Compliance was determined by approximately 6500 laboratory analyses and measurements in 2002, in addition to numerous field observations by ORNL field technicians. The NPDES permit limit compliance rate for all discharge points for 2002 was nearly 100%, with only 10 out of about 6500 individual measurements exceeding their respective permit

limits (Fig. 2.1). Information on the exceedances is provided in Appendix D, Table D-3.

The current permit requires ORNL to conduct detailed characterization of numerous storm water outfalls, develop and implement a radiological monitoring plan, develop and implement a storm water pollution prevention plan, implement a revised BMAP plan, and develop and implement a chlorine control strategy. DOE appealed certain limits and conditions of the 1996 ORNL permit, including numeric limits on effluent mercury, arsenic, and selenium.

## ETTP

ETTP is operating under NPDES Permit TN0002950, issued with an effective date of October 1, 1992. A major permit modification became effective June 1, 1995, and the permit expired on September 29, 1997. In anticipation of reindustrialization activities at ETTP and to facilitate the transfer of ownership/operation of ETTP facilities to other parties, the NPDES permit application submitted in March 1997 included a request to TDEC to issue four separate NPDES permits for the two wastewater treatment facilities, the sanitary water treatment plant, and the storm water drainage system. A permit for the K-1515 sanitary water treatment plant (TN0074233) was issued on January 14, 2000, with an effective date of March 1, 2000. The remainder of the site continues to operate under the terms and conditions of the expired permit until new permits are issued.

The ETTP NPDES permit currently includes 2 major outfalls and 136 storm-drain outfalls. Monitoring resulted in approximately 3700 laboratory analyses in 2002 in addition to numerous field measurements. There were two NPDES noncompliances in 2002, indicating a compliance rate of nearly 100% (Fig. 2.1). Information on these noncompliances is provided in Appendix D, Table D.2.

In addition to the outfall-monitoring requirements, the current ETTP NPDES permit includes requirements to develop and implement a storm water pollution prevention plan, a BMAP plan, a wastewater control and surveillance plan for wastewater treatment facilities, and monitoring of the TSCA Incinerator scrubber effluent. Additionally, four compliance schedules were included

in the permit when it was issued on September 30, 1992. These compliance schedules required termination of discharges at three major outfalls and compliance with chlorine limitations at seven outfalls. All requirements specified by the compliance schedules were met by the required deadlines.

### 2.2.12.2 Sanitary Wastewater

#### Y-12 Complex

The CWA includes pretreatment regulations for publicly owned treatment works. Sanitary wastewater from the Y-12 Complex is discharged to the city of Oak Ridge treatment works under an industrial and commercial wastewater discharge permit. City personnel performed semiannual inspections on February 14 and September 25, 2002. No deficiencies of the Y-12 Sanitary Sewer Compliance Program were noted during the inspections.

The current industrial user discharge permit was issued to Y-12 on January 1, 2000, by the city of Oak Ridge. This permit establishes discharge limits for total suspended solids, biochemical oxygen demand, total nitrogen, and various metals, and requires monitoring and reporting of uranium, gross alpha and beta, and several organic compounds. Compliance with the permit is determined from samples taken at the East End Sanitary Sewer Monitoring Station, located on the east end of the complex where the Y-12 system ties into the city's sanitary sewer collection system.

During 2002, the Y-12 Complex experienced two exceedances of the industrial user discharge permit. Both were isolated readings that did not reoccur and neither resulted in enforcement action. Compliance to a state-issued operating permit for a holding tank/pump-and-haul at office trailer 9983-AZ was also maintained.

Sanitary sewer radiological sample results at the Y-12 Complex are routinely reviewed to determine compliance with DOE Order 5400.5, "Radiation Protection of the Public and Environment." Sample results are compared to the derived concentration guides (DCGs) listed in the order. No radiological parameter that is monitored (including uranium) has exceeded a DCG.

#### ORNL

At ORNL, sanitary wastewater is collected, treated, and discharged separately from other liquid wastewater streams through an on-site sewage treatment plant. Wastewater discharged into this system is regulated by means of internally administered waste acceptance criteria based on the plant's NPDES operating permit parameters. Wastewater streams currently processed through the plant include sanitary sewage from facilities in Bethel and Melton valleys, area runoff of rainwater that infiltrates the system, and specifically approved small volumes of non-hazardous biodegradable wastes such as scintillation fluids. The effluent stream from the sewage treatment plant is ultimately discharged into White Oak Creek through an NPDES-permitted outfall (X-01). Infiltration into the system and the discharge from the on-site laundry have, at times, caused the sludge generated during the treatment process to become slightly radioactive. ORNL has completed a line-item project for comprehensive upgrades of its sanitary sewage system to reduce infiltration of contaminated groundwater and surface water and to redirect discharges from the laundry to appropriate alternative treatment facilities. The radioactivity level of ORNL sewage treatment plant sludge continues to decline. In 1998, ORNL's sewage sludge was accepted into the city of Oak Ridge's Biosolids Land Application Program. ORNL transported no sewage sludge to the Oak Ridge sewage treatment plant in 2002 because the plant was undergoing an expansion project. ORNL's sewage sludge was dried and handled as solid low-level waste. Sludge shipments are expected to resume in 2003.

#### ETTP

ETTP domestic wastewater is treated at the on-site K-1203 sewage treatment plant and is discharged pursuant to the NPDES Permit TN0002950. Beginning April 1, 1998, operation of this leased facility became the responsibility of publicly owned treatment works under a contract with CROET. The sewer-use policy of Operations Management International, Inc., and a wastewater control and surveillance program are in effect to ensure adequate treatment of wastewater at the

K-1203 plant and to ensure that effluent from the facility continues to meet all NPDES permit limits. BJC operates a holding tank/pump-and-haul system to dispose of sanitary wastewater from the K-1310-DF facility at ETTP. The permit to operate this system (State Operating Permit No. 99-033) was issued April 28, 2000, and expires April 28, 2005. Operations reports are submitted each month to the TDEC Environmental Assistance Center; there were no noncompliances or operational problems in 2002. Weskem LLC also operates a pump-and-haul system (State Operating Permit No. SOP-01042) for sanitary waste at ETTP.

### 2.2.12.3 Storm Water Protection Permits

Storm water discharges associated with construction activities that disturb more than 5 acres of land must be NPDES-permitted. Effective March 2003, the requirement is extended to include construction activities that disturb 1 acre and more. Coverage under a general permit is typically available to a construction project if the proper notice of intent is filed. In 2002, ETTP submitted one storm water notice of intent for a power line right-of-way clearing activity that resulted in the disturbance of more than 5 acres. In 2002, ORNL conducted work on one construction project that resulted in the disturbance of more than 5 acres and was therefore permitted under the Tennessee General Permit for Storm Water Runoff Associated with Construction Activity. The permitted project was the installation of new parking areas around the ORNL site to replace parking capacity that would be lost to a private development facility to be constructed east of Sixth Street in the main ORNL complex.

### 2.2.12.4 Aquatic Resources Protection

The Army Corps of Engineers, TVA, and TDEC conduct permitting programs for projects and activities that could potentially affect aquatic resources, including navigable waters, surface waters (including tributaries), and wetlands. These are the Corps of Engineers Section 404 dredge-

and-fill permits, TDEC aquatic resource alteration permits, and TVA 26A approvals.

An aquatic resource alteration permit (permit number 98-318) was issued to Y-12 in 1998 for removal of debris in East Fork Poplar Creek at the Oil/Water Separator. This permit remains valid for this location until September 2003. No TVA or Corps of Engineers permits were issued to Y-12 in 2002.

In 2002, ORNL projects that were conducted under aquatic resource alteration permits included upgrades to the Fire Protection System underground piping. At ETTP, there were no activities requiring aquatic resource protection permits conducted in 2002.

### 2.2.12.5 Oil Pollution Prevention

Section 311 of the CWA regulates the discharge of oils or petroleum products to waters of the United States and requires the development and implementation of a spill prevention, control, and countermeasure plan to minimize the potential for oil discharges. Currently, each facility implements a site-specific plan. This section of the CWA was significantly amended by the Oil Pollution Act of 1990, which has as its primary objective the improvement of responses to oil spills. On July 17, 2002, EPA issued the new final rule for 40 CFR Part 112, "Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities," in the *Federal Register*. The rule contains significant changes in the requirements for spill prevention, control, and countermeasure plans, including how the plans are prepared, reviewed, and certified, and what information must be included in the plans. Existing plans must be amended as necessary to bring them into compliance with rule revisions.

### 2.2.12.6 Clean Water Action Plan

The Clean Water Action Plan, which essentially reflects a commitment by federal agencies to work cooperatively to improve water quality in the United States, is structured around watershed-based approaches in four key areas of need:

- prioritizing and undertaking water quality assessments,

- preparing restoration action strategies,
- developing and refining water quality standards, and
- enhancing stewardship of water resources on federal lands.

On a national level, the Department of Agriculture and the Department of the Interior are developing the Unified Federal Policy for Ensuring a Watershed Approach to Federal Land and Resource Management, to which other agencies (including DOE) are contributing. The goals and principles of this multi-agency policy are to

- use a consistent and scientific approach to managing lands and resources and for assessing, protecting, and restoring watersheds;
- identify specific watersheds in which to focus budgetary and other resources and to accelerate improvements in water quality and watershed condition;
- use the results of watershed assessments to guide planning and management activities;
- work closely with states, tribes, local governments, and stakeholders to implement this policy;
- meet CWA responsibilities to adhere to federal, state, tribal, interstate, and local water quality requirements to the same extent as nongovernmental entities; and
- take steps to ensure that federal land and resource management actions are consistent with federal, state, tribal, and, where appropriate, local government water quality management programs.

## 2.2.13 Clean Air Act

Authority for implementation and enforcement of the Clean Air Act (CAA) has been delegated to the state of Tennessee by EPA as described in the State Implementation Plan. Air pollution control rules are developed and administered by TDEC.

### 2.2.13.1 General CAA Compliance

The TDEC air pollution control rules ensure compliance with the federal CAA. The TDEC Air Permit Program is the primary method by which

emission sources are reported to and regulated by the state.

CAA compliance program staff participate in regulatory inspections and internal audits to verify compliance with applicable regulations or permit conditions. Air emission sources subject to the permitting requirements are permitted, and relevant compliance documentation for these sources is maintained at each site. In addition, a number of sources that are exempt from permitting requirements under state rules but subject to listing on Title V major source operation permits are documented, and information about them is available upon request from the state. All other exempt sources are documented for internal purposes. Programs for permitting, compliance inspection, and documentation are in place and ensure that all ORR operations remain in compliance with all federal and state air pollution control regulations.

### 2.2.13.2 Title V Operating Permits

All three sites are subject to the CAA Title V Operating Permit Program. Permit applications were submitted and were determined to be complete by TDEC. However, no Title V permits had been issued for DOE operations on the ORR as of December 31, 2002. TDEC requested that all permit applications be updated due to the number of years that have passed since the original submittals. All sites have initiated application update activities that include permit hygiene and provisions for splitting some site activities into separate applications. All sites continue to operate under previously issued air permits until Title V air permits are issued.

### 2.2.13.3 National Emission Standards for Hazardous Air Pollutants for Radionuclides

Under Section 112 of the CAA, on December 15, 1989, the EPA promulgated National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities at 40 CFR 61, Subpart H. This emission standard limits emissions of radionuclides to the ambient air from DOE facilities so as not to exceed amounts that would cause any member of the public to receive in any

year an effective dose equivalent of 10 mrem/year. As noted in the preamble to this rule, the entire DOE facility at Oak Ridge, Tennessee, must meet this emission standard.

On June 10, 1996, EPA delegated authority for regulation of airborne radionuclide emissions from DOE facilities in Tennessee to the TDEC Division of Air Pollution Control. TDEC adopted the federal rule verbatim as Tennessee Rule 1200-3-11-.08, *Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities*. In addition, TDEC codified that all past formal agreements between DOE and EPA, including the May 1994 *Compliance Plan* (MMES 1994a), would be recognized provided that they are current, valid, and supported by appropriate documentation. The TDEC Division of Air Pollution Control has given primary administrative authority of the radionuclide emission standard to the TDEC Division of Radiological Health, which also licenses non-DOE nuclear facilities in the state.

During 2002, the ORR facilities operated in compliance with the Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP) dose limit of 10 mrem/year to the most exposed member of the public. Based on modeling of radionuclide emissions from all major and minor point sources, the effective dose equivalent to the most exposed member of the public was 0.3 mrem/year in 2002.

Beginning in 2000, the TDEC Division of Radiological Health required DOE to assess the dose from airborne radionuclide emissions to members of the public located on the ORR. Specifically, dose was determined for lessees located in areas of the ORR where access to the public is not restricted.

Continuous sampling for radionuclide emissions is conducted at the ETTP TSCA Incinerator, the K-33 Supercompactor, the K-33 Decontamination Room, major sources at ORNL, and exhaust stacks serving uranium-processing areas at the Y-12 Complex. Compliance with the off-site dose limit is demonstrated by using grab samples and other EPA-approved estimation techniques on the remaining minor emission points and on grouped area sources to estimate confirmatory measurements of emissions. Fugitive emissions continue to be monitored by the ORR Perimeter Air Monitoring System. In addition to

this, ETTP continued to operate a site-specific ambient air monitoring system for surveillance of TSCA Incinerator uranium emissions and fugitive emissions from remedial actions and decontamination and decommissioning projects. In addition to the ORR regulatory compliance program, the EPA and DOE Oversight Division also conduct independent ambient air monitoring programs.

### 2.2.13.4 NESHAP for Asbestos

The ORR facilities have numerous buildings and equipment that contain asbestos-containing materials. The compliance program for management of removal and disposal of asbestos-containing materials includes demolition and renovation notifications to TDEC and inspections, monitoring, and prescribed work practices for abatement and disposal of asbestos materials. No releases of reportable quantities of asbestos were reported at ETTP, ORNL, or the Y-12 Complex in 2002.

### 2.2.13.5 Air Permits

BWXT Y-12 has 32 active air permits covering 110 air emission points. All remaining emission sources are categorized as insignificant and exempt from permitting. During 2002, no new construction permits were issued, and three permits were canceled for sources no longer in service.

During CY 2002 ORNL held 11 operating permits and 1 construction permit. All remaining emission sources are categorized as insignificant and are exempt from permitting.

At the end of CY 2002, there were 88 active air emission sources under DOE control at ETTP. The total includes 30 sources covered by 8 TDEC operating permits and two construction permits. All remaining active air emission sources are exempt from permitting requirements. Permitted sources under DOE's Reindustrialization Program are no longer reported in this annual report, except for the portion of the year the source was under DOE control.

Air permit data are summarized in Appendix E.



### **2.2.13.6 NESHAP for Source Categories**

The EPA has missed congressionally established promulgation dates for a number of NESHAP “Maximum Achievable Control Technology” (MACT) standards (see 40 CFR Part 63, Subpart B, starting at § 63.50). Sources that may be subject to a delayed standard must comply with the “MACT hammer” permitting provisions in Section 112(j) of the CAA. Impacted sources must submit applications for case-by-case MACT determinations in two parts. Part 1 notified agencies of the applicability of the delayed MACT standard to the facility. Part 2 is a detailed application based on a number of requirements and is due as early as October 2003, depending upon the applicable MACT standard.

A number of MACT standards potentially applicable to ORR sources are being developed by EPA (e.g., Industrial, Commercial, and Institutional Boilers and Process Heaters; Miscellaneous Metal Parts (surface coating); Site Remediation; and Off-Site Waste and Recovery Operations). In 2002, ORR facilities submitted Part 1 applications regarding applicability of several MACT standards (e.g., Industrial Heaters/Process Boilers, Site Remediation). There are currently only two sources on the ORR subject to MACT standards. One source is the TSCA Incinerator; the other source, registered with the EPA, is a waste drum storage area at ETTP designated for storage of waste received from off site, making this area subject to the Off-Site Waste and Recovery Operations standard.

### **2.2.13.7 Stratospheric Ozone Protection**

DOE remains committed to continued reductions in the use of regulated ozone-depleting substances and, where possible, replacing them with materials reported to have less ozone-depleting potential. For example, DOE has committed to replacing Class I refrigeration appliances at all DOE installations if the appliances were installed before 1984, contain ozone-depleting substances, and have cooling capacities of 150 tons or greater, except in certain cases where replacement is not economical and will not benefit the environment. All units meeting this criterion

at ETTP, ORNL, and Y-12 have been evaluated and replaced, except for seven units located at ORNL. Six of these units have been or will be decommissioned. Due to a change in facility status, one chiller will be replaced.

### **2.2.13.8 Chemical Accident Release Prevention**

All sites on the ORR have evaluated all DOE processes for inventories of chemicals contained in quantities exceeding thresholds specified in rules pursuant to Title III, Section 112(r), “Prevention of Accidental Releases.” No risk management program plans are required for a regulated substance at any DOE facility on the ORR. Administrative measures were implemented for some processes to limit the quantity of a regulated substance that could be present in a process at any given time.

### **2.2.14 Toxic Substances Control Act**

TSCA was passed in 1976 to address the manufacture, processing, distribution in commerce, use, and disposal of chemical substances and mixtures that present an unreasonable risk of injury to human health or the environment. TSCA mandated that EPA identify and control chemical substances manufactured, processed, distributed in commerce, and used within the United States. EPA imposes strict information-gathering requirements on both new and existing chemical substances, including PCBs.

#### **2.2.14.1 Polychlorinated Biphenyls**

TSCA specifically bans the manufacture, processing, and distribution in commerce of PCBs but authorizes the continued use of some existing PCBs and PCB equipment. TSCA also imposes marking, storage, and disposal requirements for PCBs. The regulations governing PCBs mandated by TSCA are found at 40 CFR 761 and are administered by EPA. Most of the requirements of 40 CFR 761 are matrix- and concentration-dependent. TDEC restricts PCBs from being disposed of in landfills and classifies PCBs as special wastes under Tennessee solid waste

regulations. A special waste approval is required from the state of Tennessee to dispose of solid PCB-contaminated waste in landfills. Several special waste approvals for receipt of drained PCB equipment and PCB-contaminated painted materials (construction debris and/or equipment) at the Y-12 Landfill have been approved by TDEC.

### **2.2.14.2 PCB Compliance Agreements**

The Oak Ridge Reservation PCB Federal Facilities Compliance Agreement (ORR-PCB-FFCA) between EPA Region 4 and DOE-ORO became effective on December 16, 1996. The agreement addresses PCB compliance issues at ETTP, ORNL, the Y-12 Complex, and ORISE. The ORR-PCB-FFCA specifically addresses the unauthorized use of PCBs, storage and disposal of PCB wastes, spill cleanup and/or decontamination, PCBs mixed with radioactive materials, PCB R&D, and records and reporting requirements for the ORR.

### **2.2.14.3 Authorized and Unauthorized Uses of PCBs**

Specific applications of PCBs are authorized by EPA for continued use under restricted conditions. A variety of PCB systems and equipment have been in service at the ORR during its 60-year history. Many of these systems and equipment were used in accordance with industry standards at the time, and their continued use was authorized under the 1979 PCB regulations. Systems that were authorized included transformers, capacitors, and other electrical distribution equipment; heat-transfer systems; and hydraulic systems. The vast majority of these PCB uses have been phased out on the ORR. Small amounts of PCBs remain in service in PCB light ballasts; however, ballasts containing PCBs are being replaced by non-PCB ballasts during normal maintenance. Most transformers that contained PCBs either have been retrofilled (replacement of PCB fluid with non-PCB dielectric fluid) to reduce the PCB concentration to below regulated limits or have been removed from service altogether.

The 1979 regulations did not anticipate the use of PCBs in many applications for which they were used. The proposals to the 1998 “Mega Rule” that would have addressed uses still prevalent on the ORR were omitted from the final rule. As a result, past uses not specifically authorized continue to present compliance issues for DOE under TSCA.

At the ORR, unauthorized uses of PCBs have been found in building materials, lubricants, paint coatings, paint sealants, and nonelectrical systems (including a rolling mill and a reactor-positioning device). More such unauthorized uses are likely to be found during the course of decontamination and decommission activities. The most widespread of these unauthorized uses of PCBs are PCBs in paint and PCB-impregnated gaskets in the gaseous diffusion process motor ventilation systems at ETTP. The discoveries of such uses include rubber gasket components used to seal glove-box units, paint coatings used on hydraulic equipment at the Y-12 Complex, and interior and exterior wall paints. In 1998, ORNL reported finding PCBs at regulated levels in roofing paint used on Buildings 2000 and 2001. An annual sampling and monitoring plan was prepared and submitted for the site. EPA approval of the sampling and monitoring plan was verbally issued on February 11, 1999. Annual monitoring was conducted in 1999, 2000, 2001, and 2002. Summaries of the 1999 and 2002 results of that sampling were submitted to EPA as required. Submittals of the 2000 and the 2001 monitoring results were not required. In 2002, ORNL reported finding PCBs in paint in three additional buildings and in filters and ductwork in Building 3019.

In 2002, BWXT Y-12 reported finding PCBs at regulated levels in interior and exterior paint for several facilities and/or their structural components. The Y-12 Complex issued notification letters to EPA, in accordance with the terms of the ORR-PCB-FFCA, declaring that a Pre-TSCA PCB use had been discovered. Administrative controls and postings are in place to ensure that painted surfaces are not disturbed until proper evaluations are conducted. Additionally, administrative and engineering controls are used to ensure the protection of workers and the environment.

A notice of noncompliance from the EPA Region 4, was issued to the Y-12 Complex in October 2002 for the continued use of 51 legacy

PCB-contaminated transformer pads. The Y-12 Complex responded by submitting a work plan and schedule to the EPA for achieving compliance by October 2003. Quarterly status reports ensure that EPA is kept apprised of the ongoing efforts to achieve compliance. As of July 15, 2003, 45 pads (88%) had been reported as cleaned and encapsulated per EPA protocols.

#### **2.2.14.4 ETTP TSCA Incinerator PCB Disposal Approval**

The ETTP TSCA Incinerator is currently operating under an extension of EPA Region 4 approval granted on March 20, 1989. This extension is based on submittal of a reapplication for PCB disposal approval filed with EPA Region 4 on December 20, 1991, which was within the time frame allowed for reapplication. Minor amendments, updates, and corrections to this reapplication identified by DOE have been made in the interim and have been submitted to EPA. Since the submittal of the December 20, 1991, reapplication, a joint RCRA/PCB permit reapplication has been under development. This joint reapplication was submitted in March 1997 to TDEC under RCRA for treatment of hazardous wastes and to EPA Region 4 for disposal of PCB wastes. The new reapplication will replace the December 20, 1991, PCB disposal reapplication. In anticipation of this joint application, EPA Region 4 has delayed action on renewal of the PCB incineration approval.

#### **2.2.15 Federal Insecticide, Fungicide, and Rodenticide Act**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the sale and use of pesticides and requires that all pesticide products be registered by EPA before they can be sold. If a pesticide can be used according to directions without unreasonable adverse effects on the environment or applicator (i.e., if no special training is required), it is classified for general use. A pesticide that can harm the environment or injure the applicator, even when being used according to directions, is classified for restricted use. The regulations for the application of

restricted-use pesticides are presented in 40 CFR 171.

The Y-12 Complex, ETTP, and ORNL maintain procedures for the storage, application, and disposition of pesticides. Individuals responsible for application of FIFRA materials are certified by the Tennessee Department of Agriculture.

No restricted-use pesticide products are used at the Y-12 Complex, ETTP, or ORNL. An inventory of pesticide products is maintained at each facility.

#### **2.2.16 Emergency Planning and Community Right-To-Know Act**

The Emergency Planning and Community Right-to-Know Act (EPCRA), also referred to as SARA Title III, requires reporting to federal, state, and local authorities of emergency planning information, hazardous chemical inventories, and releases of certain toxic chemicals to the environment. The ongoing requirements are contained in Sections 302, 303, 304, 311, 312, and 313 of EPCRA and in 40 CFR Parts 355, 370, and 372. Table 2.11 describes the main parts of EPCRA. All DOE-ORO sites in Oak Ridge are in compliance with all aspects of EPCRA. Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* requires all federal agencies to comply with provisions of EPCRA and the Pollution Prevention Act.

##### **2.2.16.1 Planning Notification and Extremely Hazardous Substance Release Notifications (Sections 302–304)**

The ORR did not have any releases of extremely hazardous substances, as defined by EPCRA, in 2002.

**Table 2.11. Descriptions of the main parts of the Emergency Planning and Community Right-to-Know Act (EPCRA)**

Title	Description
Sections 302–303, Planning notification	Requires that local planning committee and state emergency response commission be notified of EPCRA-related planning
Section 304, Extremely hazardous substance release notification	Addresses reporting to state and local authorities of off-site releases
Section 311–312, Material safety data sheet/chemical inventory	Requires that either material safety data sheets (MSDSs) or lists of hazardous chemicals for which MSDSs are required be provided to state and local authorities for emergency planning
Section 313, Toxic chemical release reporting	Requires that releases of toxic chemicals be reported annually to the U.S. Environmental Protection Agency

### 2.2.16.2 Material Safety Data Sheet/Chemical Inventory (Sections 311–312)

Inventories, locations, and associated hazards of hazardous and extremely hazardous chemicals were submitted as required. Of the chemicals identified for CY 2002 on the ORR, 58 were located at the Y-12 Complex, 30 at ORNL, and 14 at ETPP.

Reindustrialization’s private-sector lessees were not included in the CY 2002 submittals. Under terms of their lease, lessees must evaluate their own inventories of hazardous and extremely hazardous chemicals and must submit information as required by the regulations.

### 2.2.16.3 Toxic Chemical Release Reporting (Section 313)

DOE submits an annual toxic release inventory report to EPA and TDEC on or before July 1 of each year. The report covers the previous calendar year and addresses releases of certain toxic chemicals to air, water, and land as well as waste management, recycling, and pollution prevention activities. Threshold determinations and reports for each of the ORR facilities are made separately. Operations involving toxic release inventory chemicals were compared with regulatory thresholds to determine which chemicals exceeded the reporting thresholds based on amounts manufactured, processed, or otherwise used at each facility. After threshold determinations were made, releases and off-site transfers were calculated for each chemical that exceeded

one or more of the thresholds. Filing three separate reports altered threshold determinations of the chemicals to be reported and required the reporting of transfers of the chemicals between the facilities.

The following text explains how the reporting thresholds were exceeded. Table 2.12 summarizes releases and off-site transfers for those chemicals exceeding reporting thresholds.

#### Y-12 Complex

Total 2002 reportable toxic releases to air, water, and land and waste transferred off-site for treatment, disposal, and recycling increased compared with the amounts reported for the Y-12 Complex in 2001. This increase was due primarily to increases in off-site recycling of Freon and metals and due to a slight increase in consumption of coal at the Steam Plant. The following describes the reported chemicals for the Y-12 Complex.

- **Chromium, cobalt, copper, manganese, and nickel.** The processing threshold for each of these metals was exceeded as a result of off-site metal recycling.
- **Freon 11.** The processing threshold for Freon 11 was exceeded as a result of off-site refrigerant recycling.
- **Freon 113.** Freon 113 was otherwise used in excess of the reporting threshold as a result of enriched uranium operations.

**Table 2.12. Emergency Planning and Community Right-to-Know Act Section 313 toxic chemical release and off-site transfer summary for the Oak Ridge Reservation, 2002**

Chemical	Year	Quantity (lb) <sup>a</sup>			
		Y-12 Complex	ORNL	ETTP	Total
Chromium	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	604	<i>b</i>	<i>b</i>	604
Cobalt	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	<i>c</i>	<i>b</i>	<i>b</i>	<i>b</i>
Copper	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	1,665	<i>b</i>	<i>b</i>	1,665
Freon 11	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	60,800	<i>b</i>	<i>b</i>	60,800
Freon 113	2001	16,530	<i>b</i>	<i>b</i>	16,530
	2002	19,755	<i>b</i>	<i>b</i>	19,755
Hexachlorobenzene	2001	<i>b</i>	<i>b</i>	0.0272	0.0272
	2002	<i>b</i>	<i>b</i>	0.0051	0.0051
Hydrochloric acid (aerosol)	2001	102,332	<i>b</i>	49,371	151,703
	2002	120,574	<i>b</i>	<i>b</i>	120,574
Lead/lead compounds	2001	12,759	163,892	8,460	185,111
	2002	13,531	87,395	49,277	150,203
Manganese	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	1,783	<i>b</i>	<i>b</i>	1,783
Mercury/mercury compounds	2001	395	<i>b</i>	<i>b</i>	395
	2002	428.7	<i>b</i>	<i>b</i>	428.7
Methanol	2001	22,362	<i>b</i>	<i>b</i>	22,362
	2002	65,354	<i>b</i>	<i>b</i>	65,354
Nickel	2001	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	3,047	<i>b</i>	<i>b</i>	3,047
Nitrate compounds	2001	5,641	45,000	<i>b</i>	50,641
	2002	1,639	71,000	<i>b</i>	72,639
Nitric acid	2001	2,701	41,214	<i>b</i>	43,915
	2002	2,422	53,627	<i>b</i>	56,048
Ozone	2001	<i>c</i>	<i>b</i>	<i>b</i>	<i>b</i>
	2002	<i>c</i>	<i>b</i>	<i>b</i>	<i>b</i>
PCBs	2001	<i>b</i>	<i>b</i>	307	307
	2002	<i>b</i>	<i>b</i>	296	296
Sulfuric acid (aerosol)	2001	44,221	<i>b</i>	<i>b</i>	44,221
	2002	62,201	<i>b</i>	<i>b</i>	62,201
Total	2001	206,941	250,106	84,931	541,978
	2002	353,804	212,022	49,573	615,398

<sup>a</sup>Represents total releases to air, land, and water and includes off-site waste transfers. Also includes quantities released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes.

<sup>b</sup>No reportable releases because the site did not exceed the applicable Toxic Release Inventory reporting thresholds.

<sup>c</sup>Not applicable because releases were less than 500 lb and hence a Form A was submitted.

- **Hydrochloric acid (aerosol form) and sulfuric acid (aerosol form).** Both of these acid aerosols were coincidentally manufactured in excess of the reporting threshold as a combustion by-product from burning coal at the Steam Plant.
- **Lead and lead compounds.** The otherwise-use threshold for lead was exceeded at the Steam Plant and the Central Training Facility firing range. The processing threshold for lead was exceeded as a result of off-site metal for recycling.
- **Mercury and mercury compounds.** Mercury compounds were otherwise used and coincidentally manufactured as a combustion by-product from burning coal in excess of the 10-lb reporting threshold at the Steam Plant.
- **Methanol.** Most of the methanol at the Y-12 Complex is otherwise used in the chiller buildings for the brine-methanol system.
- **Nitrate compounds.** Nitrate compounds were coincidentally manufactured in excess of the reporting threshold as by-products of neutralizing nitric acid wastes.
- **Nitric acid.** Nitric acid was used in excess of the otherwise-use threshold as a chemical-processing aid.
- **Ozone.** Ozone is manufactured at Y-12 cooling towers for microbial control.

### ETTP

- **Hexachlorobenzene.** In this reporting year, the TSCA Incinerator treated 51 lb of hexachlorobenzene; 0.08 lb of the total was received from off site. The otherwise-use activity threshold of 10 lb was exceeded at the TSCA Incinerator.
- **Lead.** The otherwise-use activity threshold for lead was exceeded. Activities and releases being reported for lead at ETTP are primarily those associated with waste management activities at the Central Neutralization Facility and the TSCA Incinerator, off-site waste

shipments, and lead contained in storm water discharges.

- **PCBs.** The otherwise-use activity threshold for PCBs was exceeded at ETTP by the incineration of PCBs in the TSCA Incinerator.

### ORNL

- **Lead.** The ORNL Lead Shop is processing lead for shielding.
- **Nitrate compounds.** Nitrate compounds were coincidentally manufactured as by-products of neutralizing nitric acid waste and as by-products of sewage treatment.
- **Nitric acid.** Nitric acid was used to regenerate ion-exchange columns at the High Flux Isotope Reactor and in the separation process for californium by the Nuclear Science and Technology Division.

## 2.2.17 Environmental Occurrences

CERCLA requires that the National Response Center be notified if a nonpermitted release of a reportable quantity or more of a hazardous substance (including radionuclides) is released to the environment within a 24-h period. The CWA requires that the National Response Center be notified if an oil spill causes a sheen on navigable waters, such as rivers, lakes, or streams. When notified, the National Response Center alerts federal, state, and local regulatory emergency organizations so that they can determine whether government response is appropriate.

During 2002 Y-12 had no releases of hazardous substances exceeding reportable quantities. There was one reportable oil sheen. The National Response Center and Tennessee Emergency Management Agency were notified of an observed oil sheen on East Fork Poplar Creek on April 17, 2002. Although the source of the oil could not be determined, actions were taken to contain and collect the oil.

One fish kill was reported. On November 19, 2002, a failure in operation of dechlorination systems at Y-12 resulted in higher than normal

levels of chlorine in the upper reach of East Fork Poplar Creek. The direct cause was attributed to the inadvertent closure of an isolation valve on a tank interrupting the flow of material necessary to control the chlorine in the creek. This caused conditions of acute toxicity to fish due to the presence of chlorine and NPDES monitoring readings to exceed permissible levels. On November 19, the total residual chlorine at Outfall 201 was measured to be 0.96 mg/L, which is above the permit limit of 0.019 mg/L; a measurement of total residual chlorine at Outfall 125 was 1.543 mg/L, which exceeded the permit limit of 0.5 mg/L. Extensive surveys of upper East Fork Poplar Creek fish community by Environmental Health and Risk Assessment Group from ORNL confirmed that 2,933 fish were killed due to the elevated chlorine. The fish kill was confined to the reach of the creek inside the Y-12 Complex.

In 2002, ORNL had no releases of reportable quantities of hazardous substances, no reportable oil sheens, and no fish kills.

During 2002, ETPP reported no reportable-quantity releases, fish kills, or oil sheens to federal or state agencies. There were also no reportable-quantity releases or oil sheens from BJC projects at NNSA or ORNL.

## 2.2.18 Implementation of Environmental Management Systems

A new DOE Order, 450.1, "Environmental Protection Program," was approved in January 2003. This order cancels and replaces DOE Order 5400.1, "General Environmental Protection Program," and DOE N 450.4, "Assignment of Responsibilities for Executive Order 13148." Executive Order 13148 is the foundation for DOE Order 450.1. The president signed Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, on April 21, 2000. The order consolidates and enhances several previously existing executive orders and affirms DOE's approach to improving environmental performance through the use of management systems and aggressive pollution prevention initiatives.

The focus of the new order is on implementing environmental management systems (EMSs) at DOE sites. An EMS is a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental goals. The EMSs must be part of the Integrated Safety Management System (ISMS) and are to be in place by December 2005.

DOE-NNSA has identified the EMS described in the International Organization for Standardization (ISO) voluntary standard ISO 14001, "Environmental Management Systems Specification with Guidance for Use" (ISO 1996), as the model of choice. The ISO 14001 model is an internationally recognized standard that provides a widely recognized set of principles and standards for integrating environmental considerations, including performance and cost, into daily business decisions. A single BWXT Y-12 Complex-Wide EMS Planning Team has been established and will serve throughout the EMS implementation. Declaration of ISO 14001 implementation by the end of FY 2004 is the goal. A key accomplishment of 2002 was the development and implementation of a procedure to identify significant complex-wide environmental aspects and impacts. Multiple-facility/organizational-specific EMS planning teams will be established, beginning in 2003, to facilitate EMS implementation within their Y-12 facilities/organizations. During 2003 facility/organizational-specific EMS planning teams will work with the complex-wide team to

- identify facility-specific environmental aspects and impacts associated with activities (processes/operations) that take place, products manufactured, and services performed at the facility;
- identify environmental objectives, targets, performance metrics, and management programs that should be applied to specific functions at relevant levels within the facility; and
- identify operational, document, and record-keeping controls; monitoring procedures; and training (existing and/or required) that are needed to ensure effective environmental management, and that the significant aspects are adequately controlled.

BJC uses ISMS core functions and guiding principles to integrate EMS considerations into its work activities. By integrating EMS considerations within the elements of ISMS, the BJC Environment, Safety and Health Organization provides procedures and processes for identifying environmental protection controls and compliance impacts and concerns prior to performing a scope of work, during work activities, and after the work is completed. Issued in September 2000, the BJC environmental management policy is a key attribute of the EMS. The policy reflects the mission, goals, and responsibilities of the company with respect to environmental aspects and impacts, including pollution prevention. At the beginning of each project, subject-matter experts, called Environmental Compliance (EC) Leads, are assigned to each subcontractor's work activity to support the formation, project, and subproject teams in identifying and analyzing environmental hazards and in implementing controls that comply with DOE Work Smart Standards and applicable laws and regulations. The EMS is supported by communication between BJC and its subcontractors through the project's EC Lead, as work activities progress. The EMS ensures that periodic assessments are conducted to evaluate the ISMS performance of both a project and its subcontractor against the EMS attributes.

During CY 2003 DOE plans to conduct a reverification of ISMS as implemented by BJC on all management and integration projects. Any changes to ISMS that result from reverification will provide opportunities to improve integration of EMS. During CY 2003, BJC will self-perform a gap analysis to determine how well EMS is being implemented through each element of the reverified ISMS. Any subsequent modifications to enhance the EMS will be made to meet the Executive Order 13148 requirement that a fully implemented EMS be in place by December 2005.

In 2002, UT-Battelle continued the implementation of an EMS that is also modeled after ISO 14001. The purpose of this system is to achieve, maintain, and demonstrate environmental excellence by assessing and controlling the impact of activities and facilities on the environment. The system is designed to ensure that UT-Battelle activities are in compliance with environmental laws and regulations, and it provides a framework for integrating compliance, pollution prevention,

and other environmental considerations into the planning and implementation phases of all UT-Battelle activities. UT-Battelle's EMS is consistent with ISMS core functions and guiding principles and includes the following features:

- a policy,
- identified significant environmental aspects and controls,
- applicable legal requirements,
- objectives and targets,
- training requirements,
- communication issues,
- records and document control requirements,
- monitoring and measurement requirements,
- an emergency preparedness and response program, and
- provisions for handling nonconformances and corrective/preventive actions.

ISO 14001 encourages organizations to make their environmental policy and significant environmental aspects of their activities available to the public. These elements of the UT-Battelle EMS are described in the following paragraphs.

The *UT-Battelle Policy for ORNL* is a high-level document that contains both scientific/technical and environment, safety, and health commitments. As required by ISO 14001, the policy contains commitments to (1) comply with applicable requirements, (2) prevent pollution, and (3) continually improve. The *UT-Battelle Policy for ORNL* is available on the web at <http://sbms.ornl.gov/sbms>.

UT-Battelle has identified the following aspects as potentially having significant environmental impacts:

- industrial waste requiring special approval for disposal;
- hazardous waste;
- radioactive waste;
- PCB waste;
- mixed waste;
- medical waste;
- recyclable materials;
- air emissions;
- liquid discharges;
- storage or use of chemicals or radioactive materials;
- use/storage of PCB-contaminated equipment;
- transuranic or Class III/IV waste;
- historic/cultural resources;



- sensitive/endangered species;
- quarantined soils or plants;
- hold-for-decay wastes;
- universal waste;
- RCRA, PCB, and CERCLA treatability studies;
- excavated soils;
- physical disturbance of aquatic environs; and
- legacy contamination.

Activities containing these aspects are carefully controlled to minimize or eliminate impacts to the environment. Monitoring activities associated with these aspects are described in Chapters 3, 5, and 7.

## 2.3 APPRAISALS AND SURVEILLANCES OF ENVIRONMENTAL PROGRAMS

Numerous appraisals, surveillances, and audits of ORR environmental activities were conducted during 2002 (see Tables 2.13, 2.14, and 2.15). These tables do not include internal DOE prime contractor assessments for 2002.

**Table 2.13. Summary of environmental audits and assessments conducted at the Y-12 Complex, 2002<sup>a</sup>**

Date	Reviewer	Subject	Issues
<b>BWXT Y-12</b>			
2/7–3/1	TDEC/Nashville/ DOE-O	TDEC Annual Clean Air Compliance Inspection	0
2/14	City of Oak Ridge	Pretreatment Inspection	0
2/26	EPA-IV & TDEC	Site Visit-Class V Underground Injection Control Wells	N/A
5/14–5/15	TDEC	TDEC Annual Hazardous Waste Inspection	0
9/25	City of Oak Ridge	Pretreatment Inspection	0
11/18–11/20	TDEC	TDEC RCRA Hazardous Waste Inspection	0
11/21–11/22	TDEC	TDEC NPDES Permit Field Visit	N/A
11/27	TDEC	TDEC Annual Clean Air Audit (This audit continued into 2003.)	N/A
<b>Bechtel Jacobs Company</b>			
1/25	TDEC & TDEC/DOE-O	Inspection of Title V Y-12 permitted emission units operated by BJC or BJC subcontractors	0
5/21	TDEC	Inspection of closed Sanitary Landfill II and Landfill VI	0
5/21	TDEC	Inspection of RCRA storage units and the wastewater treatment facility	0
7/8	TDEC	Groundwater well inspection tour and observation of groundwater well sampling	0
11/18	TDEC	RCRA hazardous waste compliance audit (included BJC facilities)	2

<sup>a</sup>Abbreviations

ORR	Oak Ridge Reservation
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	TDEC/DOE-Oversight Division
TOA	Tennessee Oversight Agreement

**Table 2.14. Summary of environmental audits and assessments conducted at Oak Ridge National Laboratory, 2002<sup>a</sup>**

Date	Reviewer	Subject	Issues
<b>UT-Battelle</b>			
1/7	TDEC/DOE-O	CAA Inspection	0
1/23	TDEC/DOE-O	CAA Inspection	0
1/30	TDEC/DOE-O	CAA Inspection	0
6/10	TDEC	RCRA inspection of generator areas	0
6/12–6/13	TDEC/DOE-O	Annual inspection of ORNL NPDES program	0
9/27	TDEC/DOE-O	Final inspection of ORNL Sewage Treatment Plant sludge holding tank	0
11/7	TDEC/DOE-O	Site visit for inspection of Aquatic Resource Alteration Permit stream crossing	0
11/19	TDEC	CAA Inspection	0
11/20	TDEC	CAA Inspection	0
11/26	TDEC	CAA Inspection	0
<b>Bechtel Jacobs Company</b>			
1/24	TDEC/DOE-O	Inspection of Title V ORNL permitted emission units operated by BJC or BJC subcontractors	0
4/11 and 11/26	TDEC and TDEC/DOE-O	Observation of detonation of container of shock-sensitive material	0
5/9	TDEC	Inspection of BJC ORNL RCRA-permitted facilities	0
6/12	TDEC and TDEC/DOE-O	Annual NPDES audit at ORNL facilities	0
11/19	TDEC	Air permit inspection at ORNL (including BJC sources)	0

<sup>a</sup>Abbreviations

CAA	Clean Air Act
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	TDEC/DOE-Oversight Division

## 2.4 ENVIRONMENTAL PERMITS

Table 2.16 contains a summary of environmental permits for the three ORR sites. Continuing permits, required at each of the ORR facilities, are RCRA operating permits, NPDES permits, and air operating permits.

## 2.5 NOTICES OF VIOLATIONS AND PENALTIES

ORNL received two notices of violations (NOVs), on June 7 and July 19, 2002, for instances of NPDES permit nonconformance that had occurred at the ORNL Sewage Treatment Plant and certain storm water discharge outfalls.

ORNL provided response correspondence as to causes and corrective measures for each instance of nonconformance. A third NPDES NOV was issued in error on November 6, 2002, and was subsequently rescinded by the issuing agency. No fines or penalties were assessed by TDEC in connection with the ORNL notices of violation.

As a result of two “self-disclosure” letters to the TDEC dated August 22 and September 13, 2001, NOVs were issued on February 4, 2002, to ORNL, ETTP, and Y-12. Based on information disseminated during the June 13, 2002, show-cause meeting, TDEC rescinded the notice associated with ORNL and dismissed those issued to the Y-12 Complex and ETTP. However, the TDEC issued a “warning letter” to Y-12 and to ETTP for violation of the Tennessee Hazardous

**Table 2.15. Summary of environmental audits and assessments conducted at the ETTP, 2002**

Date	Reviewer	Subject	Issues
1/2	TDEC	Collection of surface water samples at K-901	0
1/30	TDEC & TDEC/DOE-O	Title V permit inspection of ETTP permitted emission units operated by BJC and BJC subcontractors	0
3/19	TDEC	Collection of surface water samples at K-901	0
4/15	TDEC	Collection of surface water samples at K-901	0
5/22	TDEC	Collection of surface water samples at K-901	0
6/24	TDEC	Visual inspection of the Transportable Vitrification System (TVS) pad to verify closure	0
7/10	TDEC	Check operational status of composite sampler at K-901	0
7/18	TDEC	RCRA inspection (TSCA Incinerator and Materials and Energy Corp.)	2
7/22	TDEC	Collection of surface water samples at K-901	0
8/20	TDEC	Collection of surface water samples at K-901	0
8/28	TDEC	Visit of permit writer to TSCAI waste storage areas	0
9/17	TDEC	Inspection of RCRA storage units under Permit TNHW-056	0
10/14	TDEC	Visit of permit writer to RCRA waste storage areas under Permit TNHW-056	0
10/22	TDEC	Collection of surface water samples at K-901	0
11/4	TDEC	Reset TDEC composite water sampler at K-901	0
12/10	TDEC	Check operational status of TDEC composite water sampler at K-901	0
12/12	TDEC	Reset TDEC composite water sampler at K-901	0
12/17	TDEC	Collection of surface water samples at K-901	0

Waste Management Act. No civil penalties were assessed for violations cited against the ETTP or Y-12 because the self-disclosure met all the conditions of TDEC's self-disclosure policy. DOE did not receive economic gain from the violations, and DOE demonstrated that all the hazardous waste at issue was handled in a highly responsible and appropriate manner. This decision was further supported by the fact that there was no evidence of harm to human health or the environment, that the facility acted in good faith in its self-disclosure, and that the Knoxville Environmental Assistance Center fully supported the decision.

On September 23, 2002, an NOV was issued to DOE from TDEC for violations for failure to identify, document, and correct a spalled top layer of the secondary containment sealant within the hazardous waste storage facilities at the TSCA Incinerator at ETTP. The floor sealant in the

affected storage area has been repaired. DOE submitted a RCRA permit modification to Permit TNHW-015A to make it clearer that the secondary containment is the concrete; the sealant will be maintained as a maintenance item rather than a compliance item. No civil penalties were assessed.

On December 20, 2002, an NOV was issued to DOE and NNSA from TDEC for violations alleging that "several manifests were discovered to be missing the required signed copies from the designated facilities." The missing information was cited by TDEC personnel during the process of document review conducted during an inspection of RCRA TSDR facilities at Y-12 on November 20, 2002. Follow-up conversations revealed that faxed copies may have been provided to the TDEC inspector but that the signed copies were on file at ETTP. These signed

Table 2.16. Summary of permits as of December 2002

	Y-12 Complex	ORNL	ETTP
<b>Resource Conservation and Recovery Act (RCRA)</b>			
RCRA operating (Parts A and B)	4 <sup>a</sup>	2 <sup>b</sup>	3
Part B applications in process	0 <sup>c</sup>	1	0
Postclosure	3 <sup>d</sup>	0	0
Permit-by-rule units	13 <sup>e</sup>	115 <sup>e</sup>	9 <sup>e</sup>
Solid waste landfills	6 <sup>f</sup>	0	0
Annual petroleum underground storage tank facility certificate	2	1	1
Transporter permit	1	1	1
Hazardous and Solid Waste Amendments (HSWA) Permit	1 <sup>g</sup>	1 <sup>g</sup>	1 <sup>g</sup>
<b>Clean Water Act</b>			
National Pollutant Discharge Elimination System (NPDES)	1 <sup>h</sup>	1	1
Storm water	1 <sup>i</sup>	1 <sup>i</sup>	1 <sup>i</sup>
Aquatic resource alteration	1	1	0
U.S. Army Corps of Engineers 404 permits	0	0	0
General storm water construction	1 <sup>j</sup>	5	0
<b>Clean Air Act</b>			
Operating	31	11	8
Construction	1	1	2
Prevention of significant deterioration	0	0	0
<b>Sanitary Sewer</b>			
Sanitary sewer	1	0	0
Pump-and-haul permit	2 <sup>k</sup>	0	2
<b>Toxic Substances Control Act (TSCA)</b>			
TSCA Incinerator	0	0	1
Research and development for alternative disposal methods	0	0	0
<b>Safe Drinking Water Act</b>			
Class V underground injection control permits	0	0	0

<sup>a</sup>Four permits have been issued, representing 13 active units.

<sup>b</sup>Two permits have been issued, representing 16 active units and 5 proposed units at the end of 2002. One permit covers corrective action (HSWA) only.

<sup>c</sup>A Part B permit application for three waste piles at the Y-12 Complex was previously submitted to the Tennessee Department of Environment and Conservation (TDEC), but a permit is no longer being pursued because the waste piles are scheduled to be closed. One has already been closed.

<sup>d</sup>Three permits have been issued, representing units closed under RCRA in Bear Creek Hydrogeologic Regime, Chestnut Ridge Hydrogeologic Regime, and Upper East Fork Poplar Creek Regime.

<sup>e</sup>Number of units reported in 3016 Report/Inventory of Federal Hazardous Waste Activities. This report/inventory includes each tank unit (i.e., facility) and does not count individual tanks as separate units.

<sup>f</sup>Three landfills are operational; one is inactive and has a record of decision under the Comprehensive Environmental Response, Compensation, and Liability Act; one is closed pending certification; and one is in postclosure care and maintenance.

<sup>g</sup>Oak Ridge Reservation (ORR) permit. Requirements for corrective action have been integrated into the ORR Federal Facility Agreement.

<sup>h</sup>Issued 4/28/95 and effective 7/1/95. TDEC has incorporated requirements for storm water into individual NPDES permits.

<sup>i</sup>TDEC has incorporated into individual NPDES permits.

<sup>j</sup>Notice of intent that accesses a general NPDES permit. A notice of intent remains on file for construction at Landfills V and VII.

<sup>k</sup>This includes one Pump-and-Haul Permit for Y -12 and one at Clark Center Park which is operated by East Tennessee Mechanical Contractors.

copies were provided to TDEC. No civil penalties were assessed.

## 2.6 TENNESSEE OVERSIGHT AGREEMENT

The Tennessee Oversight Agreement is a voluntary agreement entered into between the DOE and the state of Tennessee. This agreement reflects an extension through June 30, 2006, of the agreement between the DOE and the state executed on May 13, 1991, and continues to reflect the obligations and agreements regarding DOE's technical and financial support.

The agreement is designed to assure the citizens of Tennessee that their health, safety, and environment are being protected through existing programs and substantial new commitments by DOE. Through a program of independent monitoring and oversight, the state will advise and assist to verify that DOE's activities do not adversely impact the public health, safety, or the environment. DOE and the state, in a spirit of partnership and cooperation, agree to find ways to achieve clean air, water, and land in concert with sustainable economic growth.

To date, a variety of activities have been conducted under the agreement. DOE has provided security clearances and training necessary for state employees to gain access to the sites. Environmental data and documents pertaining to the environmental management, restoration, and emergency management programs are provided or are made available to the state for its review. The TDEC/DOE Oversight Division routinely visits the three DOE sites to attend formal meetings and briefings, conduct walk-throughs of buildings and grounds, and conduct observations of site operations to assess compliance with environmental regulations. The TDEC/DOE Oversight Division also prepares an annual environmental monitoring report of its activities (TDEC 2003). The report covering the state's FY 2002 activities will be issued by July 2003 and, when completed, will be available on the web at <http://www.state.tn.us/environment/doeo/>.

## 2.7 MODERNIZATION ACTIVITIES AT THE Y-12 NATIONAL SECURITY COMPLEX

The NNSA is embarking on a significant facility and infrastructure modernization program at the Y-12 Complex. BWXT Y-12, LLC, pursuant to NNSA direction, will manage numerous construction projects as a part of this modernization program. The objectives for this modernization program are to

- consolidate operations to reduce footprint and maintenance cost,
- reuse and upgrade facilities and site infrastructure systems to be used in the future,
- replace facilities when it is the most effective alternative (new construction), and
- disposition surplus facilities and materials (infrastructure reduction).

Overall implementation of the modernization program is consistent with the site-wide environmental impact statement for the Y-12 National Security Complex and its associated record of decision (see Sect. 2.2.5). Key considerations of the modernization strategy include maintaining compliance with regulatory requirements, and coordinating NNSA's modernization activities with CERCLA requirements. The construction of new NNSA facilities is scheduled to begin prior to completion of remediation of the soils and groundwater of the Upper East Fork Poplar Creek characterization areas (see Sect. 3.4.3).

### 2.7.1 New Construction

New construction projects and initiatives in the design/planning stages include the following:

- **Special Materials Capability Program projects;**
  - **Purification Facility.** The project is for the design and construction of a facility for the purification of a special material to provide historical production capacity. The original purification process, which operated in Building 9404-11, was last operated about 1990. The evolution of health and safety requirements and con-

siderations makes reuse of the original facility not viable. Construction is scheduled to begin in the summer of 2003.

- **Beryllium Operational Efficiency.** The project is in the planning/design stage to retrofit and upgrade safety standards of an existing facility.
- **Other Special Materials Facilities.** Additional projects related to Special Materials are in the early conceptual stage.
- **Highly Enriched Uranium Material Facility.** The project will design and construct a facility for the storage of highly enriched uranium, including highly enriched uranium under International Atomic Energy Agency control. Design of the facility is nearing completion; construction is anticipated to start in September 2004.
- **Support Facilities.** Support Facilities projects will be designed and constructed to include office, record storage, a fire station, change houses and other support facilities. Construction of a 7,000-ft<sup>2</sup> change house is anticipated to start as early as October 2003.
- **Utilities Upgrade Projects.** Several utility projects are being planned. An existing

facility is being proposed for reuse under the Compressed Air project, and construction is anticipated to begin in November 2004. Other utility system projects will include a steam plant life extension, potable water system upgrades, electrical distribution system upgrades and improvements, and upgrades to other utility distribution systems.

### 2.7.2 Infrastructure Reduction

The Facility and Infrastructure Recapitalization Program is an NNSA initiative to revitalize the physical infrastructure, including demolishing deteriorated structures across the Nuclear Weapons Complex. By removing excess buildings and equipment, the Y-12 Infrastructure Reduction campaign is helping clear the way for more modern and efficient structures. In the two-year kickoff period of the Infrastructure Reduction campaign, 64 facilities were removed or demolished, part of a total footprint reduction of more than 578,000 ft<sup>2</sup>. An additional 45 buildings and 11 temporary modular offices are scheduled for demolition or removal from the site during FY 2003.