2. Environmental Compliance

It is DOE Oak Ridge Operations Office and DOE National Nuclear Security Administration 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 2003.

Each site achieved a National Pollutant Discharge Elimination System permit compliance rate greater than 99.9% in 2003.

In 2003, 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.

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 East Tennessee Technology Park (ETTP) site have been leased to private entities over the past several years through the DOE Reindustrialization Program.

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, waste chemicals, 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. 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 of hazardous waste. 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 an ORR treatment, storage, disposal, and recycle facility or shipped directly off site for treatment, storage, or disposal. At the end of 2003, Y-12 had 133 generator accumulation areas for hazardous or mixed waste; ORNL had 333 generator accumulation areas; and ETTP maintained 11. Each site is also regulated as a large-quantity handler of universal waste; however, the types of universal wastes managed as such at each site may vary.

The Union Valley Facility is also a large-quantity generator of hazardous waste. At the end of 2003, 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.

The Central Training Facility on Bear Creek Road, the Office of Secure Transportation Vehicle Maintenance Facility, the National Transportation Research Center, and the Freel's Bend area are also classified as conditionally exempt small-quantity generators.

Y-12 is registered as a large-quantity generator and a treatment, storage, disposal, and recycle 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 April 4, 2003, the permit was terminated by TDEC. 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 2003, TNHW-083, -084, and -092 were modified to update the RCRA contingency plans and to change the name of the facility to the Y-12 National Security Complex. TNHW-083 and TNHW-092 were also modified to close some units and incorporate CERCLA closing language.

ORNL is registered as a large-quantity generator and a treatment, storage, disposal, and recycle facility under EPA ID Number TN1890090003. During 2003, 23 units operated as interim-status or permitted units; another 7 units were proposed (new construction).

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). These permits are modified when necessary. Two class 1 and two class 1-1 modifications were implemented and approved in 2003 addressing changes to the ORNL RCRA Contingency Plan.

ETTP is registered as a large-quantity generator and a treatment, storage, disposal, and recycle facility under EPA ID Number TN0890090004. ETTP has received three 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.

Table 2.1. RCRA operating permits, 2003

Permit number	Building/description
	Y-12 Complex
TNHW-032[a]	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 (closed 2003)
	ORNL
TNHW-010	Hazardous and Solid Waste Amendments only
TNHW-010A	Building 7507W Container Storage Unit
	Building 7651 Container Storage Unit
	Building 7652 Container Storage Unit[b]
	Building 7653 Container Storage Unit
	Building 7654 Container Storage Unit
	Building 7669 Container Storage Unit
	Portable Buildings 1 & 2 Container Storage Unit
TNHW-097	Building 7572 Container Storage Unit
	Building 7574 Container Storage Unit
	Building 7576 Container Storage Unit
	Building 7577 Container Storage Unit
	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
	ETTP
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 (19 storage units in 2003)

[a]This permit was terminated by TDEC April 4, 2003.

[b]Incorporated May 1997; originally under TN1890090003 (TNHW-010) up to May 1997.

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, 35 RCRA units have been closed since the mid-1980s. One permitted unit, the Building 9720-59 Container Storage Unit was certified closed in 2003.

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 postclosure permit application for SWSA 6 was submitted to TDEC in September 2002; issuance of the postclosure permit is pending. The Interim Record of Decision for ORNL's Bethel Valley was issued in May 2002; its goal is to maintain the ORNL main plant as a controlled industrial-use facility.

At ETTP, the RCRA closure of K-1025C was completed in CY 2004. The only remaining RCRA-permitted vault in the K-25 Building is K-309-2A. RCRA Unit K-711 is slated for closure in FY 2005. Closure of K-1036A was deferred to RCRA action. All other cleanup actions at ETTP are being conducted under CERCLA.

RCRA assessments conducted by TDEC at the facilities resulted in three notices of violations (NOVs) issued in 2003. At Y-12, there was one NOV; at ORNL, there were four NOVs; and at ETTP, there was one NOV. 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 violations. To become compliant with RCRA, DOE entered into agreements with EPA, and later, with TDEC (see Sect. 2.2.4).

Table 2.2. Summary of 2003 annual update of ORR solid waste management units

Revision[a]	Number of sites/revisions
Additional information/revisions made to solid waste management units	11
Addition of solid waste management units to A-1(a) list	8
Solid waste management units/areas of contamination moved from A-1(a) to A-2	19
Solid waste management units/areas of contamination moved from A-2 to A-1(a)	14

[a]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 (DOE 2002a).

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^3 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 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 above-ground 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 Office of Secure Transportation Vehicle Maintenance Facility. The UST registration certificates for these tanks are current, and certificates are posted at the UST locations, enabling fuel delivery until March 31, 2005.

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 require

Table 2.3. RCRA Subtitle D landfills, 2003

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	Postclosure care and maintenance
Construction and Demolition Landfill VII	DML-01-103-0045	Operating, Class IV
Centralized Industrial Landfill II	IDL-01-103-0189	Postclosure care and maintenance

Table 2.4. ORR underground storage tank (UST) status, 2003

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

[a]Two are located off the Y-12 Complex at the Office of Secure Transportation Vehicle Maintenance Facility.

[b]The 51 "closed" USTs include deferred or excluded tanks of various categories, as detailed in the text.

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

[d]Closed tanks include two hazardous substance tanks, both of which were excavated, removed, and dismantled.

[e]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.

ments 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 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.

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 on November 21, 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.

Staff from NNSA and BWXT Y-12 have provided periodic updates of Y-12's proposed construction and demolition activities (including alternative financing projects) to managers and project personnel from the TDEC DOE Oversight Division, EPA Region 4, and DOE-ORO. A CERCLA screening process has been proposed to identify proposed construction and demolition projects that warrant CERCLA oversight. The goal is to ensure that modernization efforts do not impact the effectiveness of previously completed CERCLA environmental remedial actions, nor adversely impact future CERCLA environmental remedial 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

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 inventories, treatment capacities, and development of site treatment plans. 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 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 Waste Processing Facility only as necessary to meet the waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP). Construction of the facility was completed in fall 2003, and operations will begin in early 2004. It is operated by the Foster Wheeler Corporation.

Table 2.5. RCRA corrective action processes and 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

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 2003. The annual update of the plan has been issued for CY 2004.

The Site Treatment Plan will terminate in accordance with Sect. 2.7.2 of the Federal Facility Compliance Act, when there is no longer any land disposal restriction mixed waste, regardless of when generated, being stored on the ORR, which in the absence of a site treatment plan, 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 2003.

During 2003, 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 that would cover proposed bench- and pilot-scale research activities and generic categorical exclusions that would cover proposed nonresearch activities (i.e., maintenance activities, facilities upgrades, personnel safety enhancements) . A categorical exclusion is one of a category of actions defined in 40 CFR 1508.4 that does not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is normally required. Table 2.7 provides the number of project-specific categorical exclusions that were submitted to DOE-ORO for review and approval during 2003.

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

Unit	Major components of closure	Major postclosure requirements
Upper East Fork Poplar Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-089)		
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
Chestnut Ridge Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-088)		
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
Bear Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-087)		
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

Table 2.7. National Environmental Policy Act (NEPA) activities during 2003

Types of NEPA documentation	Y-12 Complex	ORNL	ETTP
Categorical exclusion (CX) recommendation	23	4	1
Specific CX granted	23	4	
Approved under general CX documents	66, 4[a]	41[b]	29
Environmental assessment (EA)			
EA determination			
Special EA			
Programmatic EA			
Supplemental analysis	1[c]	1	
Environmental impact statement (EIS)			
Supplemental EIS			
Programmatic EIS			

[a]National Nuclear Security Administration Small Business Projects.
[b]Projects that were reviewed and documented through the ORNL NEPA compliance coordinator.
[c]A sitewide environmental impact statement for operations of the Y-12 Complex was issued in September 2001. This supplemental analysis, performed by ORNL, addresses storage of neptunium oxide.

The Standards-Based Management System (SBMS) is the delivery system used to manage and control work at ORNL. This system uses three work-control categories: (1) research and development (R&D) programs and projects; (2) operations, maintenance and services; and (3) office environment (e.g., management, office support, and clerical activities). NEPA is an integral part of SBMS and often utilizes the division's principal investigators, environmental compliance representatives, and environmental protection officers to determine the appropriate NEPA decision. The NEPA decision is based on the approved generic categorical exclusions for a particular division, NEPA training of the person and, when necessary, guidance from the ORNL NEPA compliance coordinator. Projects involving the assignment of a project engineer from ORNL Facilities Development Division, projects that are outside the scope of generic categorical exclusions, and projects that will adversely impact cultural resources are reviewed and documented by the ORNL NEPA compliance coordinator.

DOE implemented the Facilities Revitalization Project at ORNL, and groundbreaking activities for the various infrastructures (e.g., parking lots, utilities) started in March 2002. The Facilities Revitalization Project is being accomplished through a cooperative effort between DOE, the state of Tennessee, and private entities. The environmental assessment and finding of no significant impact (DOE 2001b) that were prepared by DOE addressed the Facilities Revitalization Project phased program approach to cover construction and upgrading of facilities according to ORNL's Strategic Facilities Plan into FY 2011. A supplemental analysis was drafted for the proposed change for the storage of neptunium oxide for the Plutonium-238 Program. The supplemental analysis addressed the temporary storage of neptunium oxide in shipping packages at the Y-12 NNSA complex as an alternative to the temporary storage in wells inside Building 7930 at ORNL prior to use.

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

In 2003, an addendum was prepared for the *Final Environmental Assessment, Lease of Land and Facilities within the East Tennessee Technology Park, Oak Ridge, Tennessee* (ORO 1997). This addendum (ORO 2003) was completed and approved in July 2003 with a finding of no significant impact. This addendum was prepared to transfer title of unneeded DOE real property at ETTP to help support the accelerated cleanup of ETTP and to continue to support economic development in the region.

In 2003, NEPA reviews supported five title transfer actions and two potential lease actions as well as tenant modifications and improvements to facilities. Other NEPA reviews covered more routine maintenance actions, such as utility deactivation of several facilities, the decontamination and decommissioning of a facility, and trailer removals. One job-specific categorical exclusion was prepared and approved in 2003 for ETTP. This was for the reuse and recycling of lithium material being stored at ETTP and sodium material being stored at ORNL.

At Y-12, 23 job-specific categorical exclusion documents were prepared and were approved in 2003 in support of the Infrastructure Reduction Program. The Infrastructure Reduction effort is focused on preparing the Y-12 Complex for modernization; during FY 2003 it reduced the Y-12 "footprint" by over 107,000 ft^2 through building demolition. In addition, job-specific categorical exclusions prepared by Bechtel Jacobs Company, LLC, (BJC) were approved for the closure of Y-12 RCRA container storage unit 9720-59 and for the sale of excess lithium material. A supplemental analysis to the Y-12 sitewide environmental impact statement was conducted by ORNL and approved for the storage of neptunium oxide (a material important to the energy R&D and isotope production missions in the United States) at the Y-12 Complex. 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 90 NEPA reviews were performed and approved in 2003.

The Defense National Stockpile Center has prepared a *Draft Mercury Management Environmental Impact Statement* (April 2003) to help determine how to manage its elemental mercury inventory over the long term, because it is no longer needed for our national defense. The center has selected consolidated storage as its preferred alternative based on a combination of environmental, economic, and technical factors; policy considerations; and public and stakeholder comments. "Preferred alternative" means that, at this time, storing the mercury at one site is the best way to meet the center's objectives.

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 2003). 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, 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 Complex. A stipulation in the memorandum required ORNL to prepare and submit a site historic preservation plan and sitewide programmatic agreement to the state historic preservation officer and the advisory council within an 18-month period following the

signing of the memorandum. A draft of the historic preservation plan/programmatic agreement has been completed, comments have been received and incorporated, and a final version is being prepared for submittal to the state historic preservation officer in March 2004. In addition, a programmatic agreement among DOE-ORO, National Nuclear Security Administration, the state historic preservation officer, and the Council was signed (August 25, 2003) for the demolition of Buildings 9207 and 9210, which are ORNL-managed facilities at the Y-12 Complex. These two facilities will be captured in an Interpretive Plan that will be developed in consultation with the state historic preservation officer and the Council prior to demolition activities.

A memorandum of agreement was signed by NNSA and the state historic preservation officer on May 23, 2002, for the demolition of ten historic buildings at the Y-12 Complex. 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 the advisory council within a 12-month period following the signing of the memorandum.

The Sitewide Programmatic Agreement Among the Department of Energy Oak Ridge Operations Office, the National Nuclear Security Administration, the Tennessee State Historic Preservation Office, and the Advisory Council on Historic Preservation Concerning the Management of Historical and Cultural Properties at the Y-12 Complex provides implementing procedures to ensure the protection of the remaining 77 historic properties and structures at the Y-12 Complex. The *National Historical Preservation Act Historic Preservation Plan* (Y/TS 1893) provides an effective approach to preserving the historically significant features of Y-12's historic buildings and structures. Both the plan and the programmatic agreement were reviewed by NNSA, DOE-ORO, the Tennessee state historic preservation officer, and the advisory council in August 2003 and were approved in November 2003. In accordance with the programmatic agreement, Section 106 recordation, interpretation, and documentation information was submitted to the state historic preservation officer for the demolition of Buildings 9404-6, 9404-12, 9416-4, 9419-2, 9723-24, and 9729. The state historic preservation officer reviewed and agreed that the Section 106 documentation adequately mitigated project effects upon properties eligible for listing in the *National Register of Historic Places*.

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* (DOE, 2001a).

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 began in 2003 to develop a path forward, and a memorandum of agreement will be negotiated among the consulting parties. During 2003, 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 memorandum of agreement was prepared and signed by all consulting parties. 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. An architectural and engineering firm was retained to develop design proposals for capturing

and presenting the historical significance of the K-25 and K-27 facilities in 2003. The report is scheduled to be completed and presented to the consulting parties in 2004.

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 total area of 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 Spallation Neutron Source (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. Monitoring results to date suggest that the wetland is on its way to being fully restored.

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.

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.) 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.

2.2.9.1 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 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 river snail), 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 nest here in future years. Similarly, several state-listed bird species, such as the anhinga, olive-sided flycatcher, and little blue heron, are currently uncommon migrants or visitors to the reservation; however, the little blue heron is 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 Threatened and Endangered Plants

There are currently 24 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.

Table 2.8. Animal species of concern reported from the ORR[a]

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

[a]Land and surface waters of the ORR exclusive of the Clinch River, which borders the ORR.

[b]E = endangered, T = threatened, NM = in need of management.

[c]The peregrine falcon was federally delisted on August 25, 1999.

[d]The bald eagle was proposed for federal delisting on July 6, 1999.

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).

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

Table 2.9. Currently known or previously reported vascular plant species from the ORR that are listed by state or federal agencies, 2003

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

[a]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.

[b]*Carex oxylepis var. pubescens* has not been observed during recent surveys.

[c]*Lilium michiganense* is believed to have been extirpated from the ORR by the impoundment at Melton Hill.

[d]*Populus grandidentata* was reported in two ORR locations. One of the reports was confirmed, but the tree died during the year.

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 the 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.

Table 2.10. Additional rare plants that occur near and could be present on the ORR, 2003

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

[a]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.

[b]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.

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 ETTP perform certain monitoring activities, including free residual chlorine, bacteriological, disinfectant by-products, 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 sampled in 2003. Y-12 and ORNL were compliant with the lead and copper requirements. In addition, the Y-12 and ORNL drinking water distribution system's bacteriological sample analyses were satisfactory in 2003. ETTP monitors the levels of turbidity and of organic, inorganic, and radioactive contaminants in finished drinking water at its water plant. All test results during 2003 were satisfactory.

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 as a nontransient, noncommunity water supply system by TDEC 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 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 that are 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. Authority for implementation and enforcement of the NPDES program has been delegated by EPA to the state of Tennessee.

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 90 active point-source discharges or storm water monitoring locations are monitored for compliance with the permit. Monitoring resulted in approximately 9,370 laboratory analyses in 2003 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 six NPDES noncompliances in 2003 (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*, (BWXT 2002). Other documents submitted to TDEC in accordance with the NPDES permit include the *Radiological 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 TN0002941, 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 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 2003, in addition to numerous field observations by ORNL field technicians. The NPDES permit limit compliance rate for all discharge points for 2003 was nearly 100%, with only two out of about 6500 individual measurements exceeding their respective permit limit (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 Biological Monitoring and Abatement Program (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

The ETTP NPDES Permit TN0002950 went into effect on October 1, 1992. Effluent limitations in this permit were water-quality based, which reflected the trend toward considering the effects of industrial discharges on

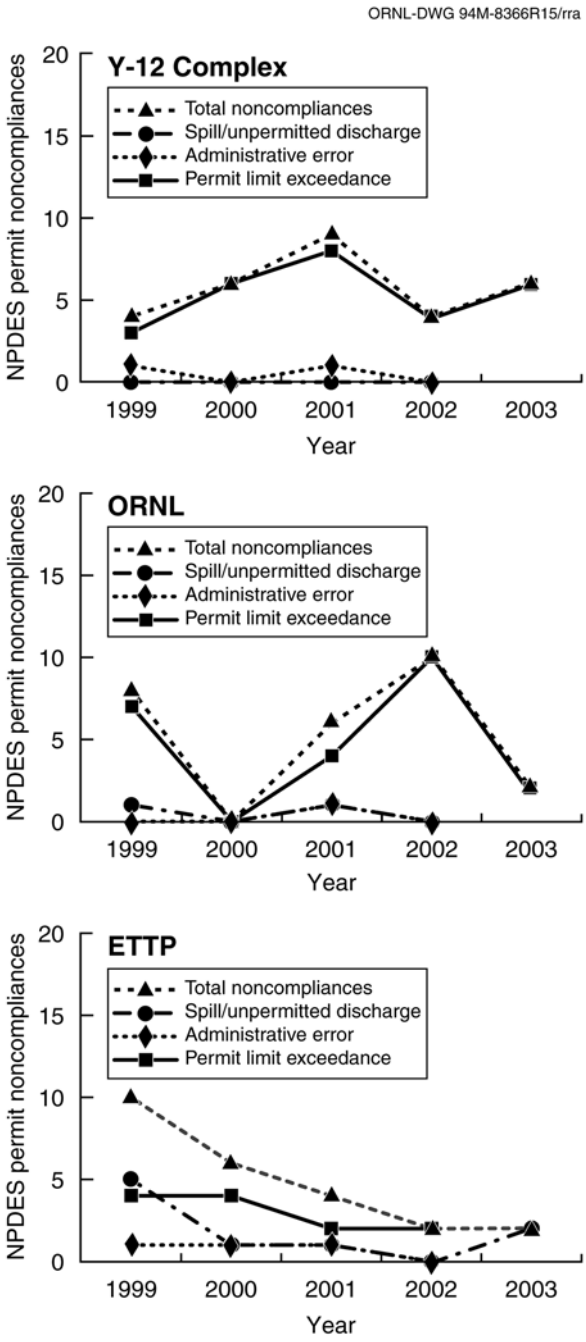

Fig. 2.1. Five-year summary of NPDES noncompliances.

the quality of the receiving streams. In accordance with the federal regulations requiring the inclusion of storm water discharges in the NPDES permitting program, all storm water outfalls were included in this permit, and development of a storm water pollution prevention plan was required. A major modification was issued effective June 1, 1995. The modification included removal of inactive outfalls, addition of effluent limits for new treatment technologies at the Central Neutralization Facility, addition of new storm drains, and clarification of various requirements. In accordance with this NPDES permit, the ETTP is authorized to discharge process wastewater, cooling water, storm water, steam condensate, and groundwater to the Clinch River, Poplar Creek, and Mitchell Branch.

The ETTP NPDES Permit expired on September 29, 1997. An application for renewal of this permit was submitted to TDEC in March 1997. To facilitate the transfer of ownership and operation of ETTP facilities to other parties, it was determined that separate NPDES permits would be required for each of the ETTP treatment facilities. In addition, it was determined that a separate NPDES permit for the storm water drainage system would be necessary. A general NPDES permit for former outfalls 009 (K-1515 Sanitary Water Plant) and 013 (K-1513 Sanitary Water Intake Backwash Filter) was issued on January 14, 2000, and became effective on March 1, 2000. The issuance of this permit (Permit Number TN0074233) allowed outfalls 009 and 013 to be removed from ETTP NPDES Permit Number TN0002950. A permit for the K-1203 sewage treatment plant (permit number TN0074241) was issued by TDEC and became effective on August 1, 2003. This allowed outfall 005 to be removed from ETTP NPDES Permit Number TN0002950. A permit for the K-1407-J Central Neutralization Facility (permit number TN0074225) was issued on October 7, 2003, and became effective on November 1, 2003. This allowed outfall 014 to be removed from ETTP NPDES Permit Number TN0002950. ETTP storm water outfalls continue to discharge under NPDES Permit Number TN0002950; the permit was re-issued on March 1, 2004, with an effective date of April 1, 2004.

During most of 2003 the NPDES Permit Number TN0002950 included the K-1203 Sewage Treatment Plant and K-1407-J Central Neutralization Facility outfalls and 136 storm water outfalls. In CY 2003, 42 spills were reported at ETTP, but only 2 of them resulted in NPDES noncompliances. With approximately 3100 laboratory analyses in 2003, this represents a compliance rate of almost 100% (Fig. 2.1). Details of the two noncompliances (a diesel fuel leak and a sewer line overflow) are given in Sect. 4.4 and in Appendix D, Table D.2.

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 March 20 and September 10, 2003. 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 2003, the Y-12 Complex experienced three exceedances of the industrial user discharge permit. These exceedances were elevated readings of metals (iron and arsenic) usually associated with coal. It is believed that the elevated readings relate to two isolated upsets at the Steam Plant Wastewater Treatment Facility. Levels have returned to normal. 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 nonhazardous 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. During 2003, ORNL's sewage sludge was dried and handled as solid low-level waste. Shipments of sludge to the city of Oak Ridge are expected to resume in 2004.

ETTP

ETTP domestic wastewater is treated at the on-site K-1203 sewage treatment plant and is discharged pursuant to the NPDES Permit TN0074241; this permit became effective on August 1, 2003. Beginning on 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 2003. Weskem LLC, a BJC subcontractor, 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 was 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 June 2003, TDEC issued a General Permit for Storm Water Associated with Construction Activity for the Y-12 Purification Facility. In 2003, ETTP submitted one storm water notice of termination for a power line right-of-way clearing activity after final stabilization had been achieved, all storm water discharges associated with the construction activity had ceased or been eliminated, and temporary erosion and sedimentation control measures had been removed. In 2003, ORNL had seven construction projects covered by the Tennessee General Permit for Storm Water Runoff Associated with Construction Activity. These included the SNS project, parking lot improvements, Advanced Materials Characterization Laboratory, ORNL Research Support Center, the ORNL Laboratory for Comparative and Functional Genomics, the ORNL Fire Protection Systems Upgrades, and ORNL Water System Upgrade.

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.

In July 2003, TDEC issued a General Permit for Maintenance Activities for Modification to Storm Drain and NPDES Outfall 113 at the Y-12 Purification Facility construction project. This permit is basically an aquatic resources activity. No TVA or Corps of Engineers permits were issued to Y-12 in 2003.

In 2003, ORNL projects that were conducted under aquatic resource alteration permits included upgrades to the ORNL water system and drainage modifications around the swan pond. At ETTP, an aquatic resource alteration permit and a Department of the Army permit were obtained for removal/repair of crossovers on Mitchell Branch; however, no field activities were conducted in 2003.

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 the information that must be included in the plans. Existing plans must be amended as necessary to bring them into compliance with rule revisions by February 17, 2006. The amended plans must be fully implemented by August 18, 2006.

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 multiagency 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 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, 2003. TDEC requested that all permit applications be updated due to the number of years that have passed since the original submittals. All sites have submitted updated permit 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 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 2003, 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 0.2 mrem/year in 2003.

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, 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 2003.

2.2.13.5 Air Permits

BWXT Y-12 has 33 active air permits covering 108 air emission points. All remaining emission sources are categorized as insignificant and exempt from permitting. During 2003, one new construction permit was issued for the Purification Facility.

During CY 2003, 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 2003, 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 not reported in this annual report, except for the portion of the year the source was under DOE

control. These sources are under the responsibility of CROET and are operated by Operations Management International, Inc.

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 on a specific date, 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 2003, 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 refrigeration appliances at all DOE installations if the appliances were installed before 1984, contain Class I 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 bulk product waste (painted 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 Polychlorinated Biphenyl Federal Facilities Compliance Agreement 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. It 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, 2002, and 2003. Summaries of the 1999, 2002, and 2003 results of that sampling were submitted to EPA as required. Submittals of the 2000 and the 2001 monitoring results were not required. In 2003, ORNL reported finding PCBs in paint in additional buildings or on equipment (e.g., tanks).

In 2003, 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 Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement, 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 September 22, 2003, all 51 pads had been cleaned and encapsulated using 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.

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. Requires that an inventory of hazardous chemicals maintained in quantities over thresholds be reported annually to the U.S. Environmental Protection Agency.
Section 313, Toxic chemical release reporting	Requires that releases of toxic chemicals be reported annually to the U.S. Environmental Protection Agency

2.2.16.1 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 2003.

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 2003 on the ORR, 64 were located at the Y-12 Complex, 30 at ORNL, and 14 at ETTP.

Reindustrialization's private-sector lessees were not included in the CY 2003 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 2003 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 2002. This increase was due primarily to increases in off-site recycling metals and due to an increase in machining and welding activities. The following describes the reported chemicals for the Y-12 Complex.

Table 2.12. Emergency Planning and Community Right-to-Know Act Section 313 toxic chemical release and off-site transfer summary for the ORR, 2003

Chemical	Year	Quantity (lb)[a]			
		Y-12 Complex	ORNL	ETTP	Total
Chromium	2002	604	*b*	*b*	604
	2003	3,906	*b*	*b*	3,906
Cobalt	2002	*c*	*b*	*b*	*b*
	2003	914	*b*	*b*	914
Copper/Copper Compounds	2002	1,665	*b*	*b*	1,665
	2003	8,296	*b*	*b*	8,296
Freon 11	2002	60,800	*b*	*b*	60,800
	2003	*b*	*b*	*b*	*b*
Freon 113	2002	19,755	*b*	*b*	19,755
	2003	32,020	*b*	*b*	32,020
Hexachlorobenzene	2002	*b*	*b*	0.0051	0.0051
	2003	*b*	*b*	*b*	*b*
Hydrochloric acid (aerosol)	2002	120,574	*b*	*b*	120,574
	2003	116,899	*b*	*b*	116,899
Lead/lead compounds	2002	13,531	87,395	49,277	150,203
	2003	9,342	43,876	72,047	125,265
Manganese	2002	1,783	*b*	*b*	1,783
	2003	6,170	*b*	*b*	6,170
Mercury/mercury compounds	2002	428.7	*b*	*b*	428.7
	2003	47.6	*b*	*b*	47.6
Methanol	2002	65,354	*b*	*b*	65,354
	2003	77,571	*b*	*b*	77,571
Nickel	2002	3,047	*b*	*b*	3,047
	2003	3,319	*b*	*b*	3,319
Nitrate compounds	2002	1,639	71,000	*b*	72,639
	2003	5,651	80,000	*b*	85,651
Nitric acid	2002	2,422	53,627	*b*	56,048
	2003	2,942	81,362	*b*	84,304
Ozone	2002	*c*	*b*	*b*	*b*
	2003	*c*	*b*	*b*	*b, c*
PCBs	2002	*b*	*b*	296	296
	2003	*b*	*b*	158	158
Sulfuric acid (aerosol)	2002	62,201	*b*	*b*	62,201
	2003	58,982	*b*	*b*	58,982
Total	2002	353,804	212,022	49,573	615,398
	2003	326,060	205,238	72,205	603,503

[a]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.

[b]No reportable releases because the site did not exceed the applicable Toxic Release Inventory reporting thresholds.

[c]Not applicable because releases were less than 500 lb and hence a Form A was submitted.

- **Chromium**, cobalt, copper compounds, manganese, and nickel. The processing threshold for each of these metals was exceeded as a result of off-site metal recycling and metal machining and welding operations.

- **Freon 113.** Freon 113 was otherwise used in excess of the reporting threshold as a result of enriched uranium operations.

- **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 coincidently 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

- **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 waste received from off site in the TSCA Incinerator.

ORNL

- **Lead.** The ORNL Lead Shop processes lead into different shapes for use as shielding in research projects involving radioactive isotopes.

- **Nitrate compounds.** Nitrate compounds are coincidentally manufactured as by-products of neutralizing nitric acid waste and as by-products of sewage treatment.

- **Nitric acid.** Nitric acid is used to regenerate ion-exchange columns at the Process Waste Treatment Complex and at the High Flux Isotope Reactor; in the separation process for californium by the Nuclear Science and Technology Division; and for pH adjustment at the Process Waste Treatment Complex.

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 2003, 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 November 24, 2003. Transformer oil was spilled inside a dumpster. A rain event washed a small amount of residual oil from the dumpster to East Fork Poplar Creek.

During 2003, ETTP had no releases of reportable quantities of hazardous substances and no fish kills. There was one reportable oil sheen. The National Response Center and Tennessee Emergency Management Agency were notified of an oil sheen observed on the K-1007-P1 Pond on January 21, 2003. The oil sheen resulted when a vendor vehicle developed a fuel leak at ETTP, and a rain event washed the spilled diesel fuel into the storm drain system. In 2003, ORNL had no releases of reportable quantities of hazardous substances, no reportable oil sheens, and no fish kills.

2.2.18 DOE Order 450.1, Environmental Protection Program

In January 2003, DOE Order 450.1, "Environmental Protection Program," was issued. It encompasses environmental management systems (EMSs), pollution prevention, affirmative procurement, ozone depleting substances, energy management and fleet management, and beneficial landscaping requirements. 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 ORR sites are addressing the requirements of this order as well as all other requirements related to these areas. The 2003 efforts and associated results across the ORR are summarized in the remainder of this section.

2.2.18.1 Implementation of Environmental Management Systems

An EMS is a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental goals. The EMSs are to be integrated with the sites' Integrated Safety Management System (ISMS) by December 2005. ISMS and EMS both strive for continual improvement, through a plan-do-check-act cycle. Under ISMS, the term "safety" also encompasses environmental safety and health, including pollution prevention, waste minimization, and resource conservation. Therefore, the guiding principles and core functions in ISMS are as applicable to the protection of the environment as they are to safety. Figure 2.2 depicts the relationship between EMS and ISMS.

Fig. 2.2. The relationship between EMS and ISMS.

UT-Battelle and BWXT Y-12 have both chosen to implement EMSs that are modeled after the international standard established by ISO 14001. The purpose of this system is to achieve, maintain, and demonstrate continuing environmental improvement by assessing and controlling the impact of activities and facilities on the environment. The system is designed to ensure that 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 site activities. The ISO 14001 EMS is consistent with ISMS core functions and guiding principles and includes the following features:

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

Environmental aspects are elements of an organization's activities, products, or services that can interact with the environment. In the ISMS, these may be thought of as environmental hazards associated with a facility operation or work activity.

UT-Battelle EMS Implementation Status

The UT-Battelle EMS is integrated into ISMS through the work control process. All significant environmental aspects are incorporated into work control to ensure that appropriate controls are in place.

In 2003, UT-Battelle conducted an EMS audit in preparation for third-party registration in 2004. Several minor deficiencies were noted during the assessment. Corrective action plans have been developed and are being implemented.

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 environmental policy statements in the *UT-Battelle Policy for ORNL* are available on the external web site at http://train.ornl.gov/wbt/EnvPolicy.cfm.

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.

BWXT Y-12 EMS Implementation Status

BWXT Y-12 continued the ISO 14001 planning phase during 2003 and is prepared to move to the implementation phase during 2004.

BWXT Y-12 Policy Y72-001, *Environment, Safety, and Health*, is the top-level guiding principle for protecting the workers, the public, the environment and for preventing pollution whenever activities are planned and performed. In addition, Policy Y72-006, *Y-12 Pollution Prevention and Sustainability Policy* , affirms the commitment of BWXT Y-12 to continually integrate sustainability principles into its activities in a safe, compliant, and cost-effective manner. These policies and the commitment of top management are summarized below and may be viewed on the BWXT Y-12 public web page (http://www.y12.doe.gov/bwxt/).

BWXT Y-12 is committed to establishing a safety envelope for all activities by identifying, evaluating, and developing controls for potential hazards. Work is carried out in a manner that

- provides safe working conditions and protects workers' health;
- implements behavior-based safety to further reduce risk of exposure;
- protects the public and the environment;
- prevents pollution;
- complies with applicable regulations;
- continuously improves our management systems and performances; and
- integrates sustainability principles and practices in a safe, compliant, and cost-effective manner.

In addition to established policy, BWXT Y-12 has identified legal and other requirements, evaluated activities for significant environmental aspects, and incorporated them into the ISMS process. The ISMS process includes hazard analysis of work activities (operations, maintenance, and construction) and the appropriate involvement of subject matter experts including environment, safety, and health professionals.

BWXT Y-12 EMS criteria for defining significant aspects are based on actual and perceived impacts and on regulatory requirements. The following aspects have been identified as potentially having significant environmental impact:

- Waste generation—excess materials and chemicals, low-level radiological, hazardous, mixed, PCB waste, universal, special industrial, medical, and sanitary
- Air emissions—criteria pollutants, hazardous air pollutants and other non-radiological air contaminants, ozone, and radiological emissions
- Liquid discharges—process wastewater, cooling water, sanitary wastewater, flow management, chlorinated water discharges
- Potential releases from spill, leaks, runoff—storage of radiological and nonradiological materials, oil and gas, waste, storm water runoff
- Spread of legacy contamination—historical waste management units, legacy mercury and PCB spills, demolition of excess and surplus facilities, groundwater contamination
- Interactions with historical and cultural resources and wildlife habitat
- Natural resource consumption—power and energy usage
- Natural resource conservation—purchasing materials with recycled content, recycling, and preventing pollution.

Activities involving these aspects are evaluated and controlled to minimize potential impacts to the environment. Monitoring activities associated with these aspects are described in Sects. 6 and 7.

Key goals for ISO 14001 implementation during 2004 will be the integrating of EMS audit tools with the ISMS processes for independent and management assessment and updating performance measures to monitor continual improvement.

BJC EMS Implementation Status

BJC uses ISMS core functions and guiding principles to integrate EMS considerations into 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 and protection leads," are assigned to each subcontractor's work activity to support the formation of 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 environmental compliance and protection lead. The EMS ensures that periodic assessments against the EMS attributes are conducted to evaluate the ISMS performance of each project and the subcontractor in charge of managing the project.

During CY 2003, DOE conducted a reverification of ISMS as implemented by BJC on all management and integration projects. Also during CY 2003, BJC self-performed a preliminary gap analysis to determine how well EMS is being implemented through each element of the reverified ISMS. During CY 2004, BJC will develop EMS Awareness Training on the EMS. 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.

2.2.18.2 POLLUTION PREVENTION

During 2003, the ORR continued to implement a substantial number of pollution prevention projects, which were reported to DOE. Reported results are summarized by program secretarial office in Table 2.13. Pollution-prevention-specific information is also available on the DOE pollution prevention homepage at http://www.eh.doe.gov/p2/.

The ORR Sites' pollution prevention programs are required by federal and state laws and regulations, executive orders, and DOE policies, notices, and orders. During 2003, in addition to supporting the implementation of pollution prevention projects, the ORR facilities performed activities to ensure the new requirements established by DOE Order 450.1 were addressed as well as all other existing requirements. The ORR facilities must complete pollution prevention-related requirements such as planning and reporting to comply with many regulatory requirements, including RCRA, the Tennessee Hazardous Waste Reduction Act, and the EPCRA/Pollution Prevention Act. The ORR facilities must also comply with DOE requirements including reporting of pollution prevention project and program activities. The *Annual Report on Waste Generation and Pollution Prevention Progress*, the annual *Affirmative Procurement Report*, and reports on pollution prevention projects completed by each site are designed to provide data used to measure progress toward DOE's FY 2005 and 2010 pollution prevention goals. Reported percentages reduction results for FY 2003 (based on a 1993 baseline) are summarized by program secretarial office or by the site as appropriate in Table 2.14.

The ORR also supports DOE's goal of reducing off-site releases and transfers of toxic chemicals by assessing operations associated with these releases and transfers. However, because of substantial changes since 1993 in the operations included in the EPCRA-related reporting from which these values are obtained, the ORR does not anticipate an overall reduction when compared with the 1993 baseline. Information on program secretarial office-specific and site-specific waste generation, recycling, and affirmative procurement is also available on the DOE pollution prevention homepage at http://www.eh.doe.gov/p2/.

Additionally, each site's data are included in DOE's complex-wide reports. Elements of DOE's annual reports are extracted and included in DOE's central internet database, which provides national-level DOE waste management and cleanup data to the public, as required by the December 1998 settlement agreement between DOE and the Natural Resources Defense Council, Inc.

Table 2.13. 2003 ORR pollution prevention project implementation results summary

Program secretarial office	Total number of pollution prevention projects reported in FY 2003	Total quantity of waste reduced in FY 2003 (MT or m^3)	Total cost avoidance in FY 2003 (Millions of $)
NNSA /DP[a]	70	18,245	4.0
EM[b]			
SC[c]/Other R&D	15	1,901	3.0

[a] National Nuclear Security Administration/Defense Program
[b] Environmental Management
[c] Office of Science

In FY 2003, ORR-related activities received the following DOE pollution-prevention awards in recognition of specific 2002 pollution-prevention accomplishments:

- Recycling—Y-12 Technical Library Book Recycling Project
- Environmental Preferability—Demonstration of a Web-Based Chemical Purchasing and Management System
- Environmental Restoration—Lasagna™ Soil Remediation Technology
- Model Facility Demonstration/Complexwide Achievement—DOE's Homeland Defense Equipment Reuse Program.

To support future pollution prevention implementation, compliance, and goal achievement, the ORR sites' pollution prevention programs continue to pursue site projects, perform required activities, and complete required reporting.

2.2.18.3 OZONE-DEPLETING SUBSTANCES PHASE-OUT EFFORTS

Significant progress has been made in eliminating use of Class I and Class II ozone-depleting substances at the Y-12 Complex, and a number of projects have been identified to further reduce ozone-depleting substance uses. The Y-12 Complex ozone-depleting substances Phase-Out and Management Plan, Y/TS-1880, was issued in 2003 and provides a complete discussion of requirements and compliance activities at the Y-12 Complex.

One of the pollution prevention goals involving ozone-depleting substances is to retrofit or replace by 2005 100% of chillers using Class 1 refrigerants that have a cooling capacity of greater than 150 tons and that were manufactured before 1984. In December 1998, a $12.8 M line item project, "Retrofit Heating Ventilation and Air Conditioning (HVAC) and Chillers for Ozone Protection" was completed at the Y-12 Complex. A significant number of chillers were retrofitted, replaced, or taken out of service. The last remaining chiller that falls under this definition is located in Building 9767-3 in the biology area at the Y-12 Complex and belongs to ORNL. This chiller was taken out of service, and the freon was removed in March 2004.

The second pollution prevention goal involving ozone-depleting substances is to eliminate Class I ozone-depleting substances by 2010 to the extent economically practicable and to the extent that safe alternative chemicals are available for DOE Class 1 applications. The Y-12 Complex has accomplished this goal to the extent economically practicable and to the extent that safe alternative chemicals are available for Y-12–specific applications. A number of actions have been initiated to achieve this goal, including product substitutions for solvent uses, retrofits or replacements for chiller systems, and product substitutions for fire-protection systems. For example, the use of Halon in fire-protection systems has been eliminated. Where availability of safe alternatives or economic factors prevent elimination of ozone-depleting substances use, Y-12 Complex continues to pursue viable options (e.g., elimination of Freon 12 and Freon 113 solvent usage in some of Y-12's major production facilities). Four remaining chillers with Class 1 ozone-depleting substances are being assessed to determine the long-term need for these systems while taking into account economic considerations.

Table 2.14. 2003 ORR affirmative procurement and waste reduction progress summary[a]

Program secretarial office	Waste reduction by office (%)				Site	Sanitary waste reduction by site (%)	
	Transuranic	Mixed low-level and RCRA	Low-Level	Affirmative procurement		Landfill	Recycling
NNSA /DP[a]	N/A	92	44	87	Y-12	87	71
EM[b]					ETTP		
SC[c]/Other R&D	93	85	77	82	ORNL	40	31

[a] National Nuclear Security Administration/Defense Program
[b] Environmental Management
[c] Office of Science

ORNL has implemented a plan to eliminate the use of Class I ozone-depleting substances. This plan included the replacement, retrofit, or decommissioning of all chillers that require Class I substances, the gradual phase out of smaller refrigeration systems that require Class I substances, the elimination of all fire-protection systems that use Class I substances, and the elimination of all other systems or processes that require Class I substances. Currently, Class I substances are used in small refrigeration systems such as refrigerators and window air conditioners. As these units fail, they are replaced with new units that use Class II or unregulated refrigerants.

DOE Guidance dated October 1999, requires that all DOE facilities retrofit or replace by 2005 all chillers using Class I refrigerants that are greater than 150 tons of cooling capacity and were manufactured prior to 1984. ORNL operated a number of chillers that were impacted by this requirement. All of these impacted chillers have been retrofitted, replaced, or decommissioned, except one chiller located in Building 3525. This chiller was to be decommissioned; however, plans for the 3525 facility were changed in 2003, requiring that the chiller be replaced in accordance with the DOE requirement. Plans are being developed to replace this chiller.

ETTP completed the phaseout of Class 1 ozone-depleting substances equipment in the mid-90s. At that time, ETTP surplused and moved all Class 1 ozone-depleting substances to other DOE sites so they are no longer part of the ETTP ozone-depleting substances inventory. One exception exists, a small amount—300 lb of Class 1 R-12 refrigerant—was maintained in the ETTP inventory in CY 2003 for servicing older, small units/appliances (i.e, freezers and refrigerators) for the duration of their expected service life.

2.2.18.4 ENERGY MANAGEMENT (including Fleet Management)

BWXT Y-12 prepared a multiyear Energy Management Plan that defines the general energy requirements of the Y-12 Complex and provides a brief history of energy reduction efforts and a timetable for further energy savings measures. The primary focus for energy conservation is on electricity, with secondary concentrations on reducing the use of natural gas, fuel (gasoline and diesel), coal, and water.

Over the past 15 years, the energy consumption at Y-12 has been reduced by more than 40%. Much of this reduction came as a result of reduced production activities and energy savings measures, such as replacing chillers, eliminating cooling towers, and regularly overhauling steam plant boilers.

ORNL's Energy Management and Implementation Plan outlines the strategy for managing and implementing short- and long-range energy-related activities. As a result of ORNL's emphasis on energy and utilities management and projects, standard building energy intensity has been reduced by approximately 20% compared with FY 1985 usage (based on British thermal units per gross square foot). Also, the energy intensity for high-energy-use facilities has been reduced by 65%. Specific activities include the following.

Energy Star. In FY 2000 ORNL was awarded the EPA's Energy Star Award for a building, the

first DOE building to achieve this rating and only the second building in the state of Tennessee to do so. ORNL is currently reviewing utilities data to determine whether additional ORNL buildings are eligible for Energy Star Awards in FY 2004.

Leadership in Energy and Environmental Design (LEED) and Sustainability. The newly constructed East Campus Modernization project at ORNL used third-party financing to add over 300,000 ft^2 of energy-efficient office, laboratory, and computer space and achieve a savings of $0.5 M in annual energy costs (30% savings compared with the baseline conventional design). This project was recently certified by the U.S. Green Building Council as a LEED-certified project.

Chlorinated Fluorocarbon (CFC) Reductions. As part an aggressive chiller replacement program, ORNL has replaced 16 chillers totaling 8,200 tons in cooling capacity, well ahead of legislated requirements. As a result, chiller energy use has dropped an average of 21% for an annual savings of $280 K, and CFC emissions have been cut by 5,000 lb/year. ORNL continues to replace smaller CFC chillers and has transferred all R-113 and most of the R-11 stored refrigerant to a refrigerant recycler.

Water Savings. Water-related projects and management efforts have resulted in water usage being reduced by 108 million gal, nearly10%, since FY 2000.

Green Power. ORNL participates in TVA's "Green Power Switch" program. ORNL was TVA's first industrial green power participant and purchases 675 MWh in green power annually.

Distributed Energy Resource. Combining solar power with natural-gas-fired turbine technology, ORNL's 30-kW distributed energy resource research project won a Federal Energy Saver Showcase Award in FY 2002.

Greenhouse Gas Emission Reductions. Even though the gross square footage at ORNL has increased almost 20% since FY 1995, the relatively recent conversion from coal to natural gas as the primary fuel at the central steam plant has reduced CO_2-equivalent greenhouse gas emissions by 29% over the same time period.

Vehicle Fleet Management. ORNL is working to minimize the use of petroleum-based fuels in the vehicle fleet. To minimize gasoline consumption, 70 ethanol-burning vehicles are in service (12 purchased in FY 2003 and 9 in FY 2004). Additional alternative fuel vehicles are being added to the fleet as funding allows.

2.2.18.5 Beneficial Landscaping Practices

DOE Order 450.1 incorporates Executive Order 13148, "Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds." The guidance applicable to DOE-site landscaping includes

- Use of Regionally Native Plants for Landscaping;
- Design, Use, or Promotion of Construction Practices that Minimize Adverse Effects on the Natural Habitat;
- Seeking to Prevent Pollution;
- Implementing Water and Energy Efficient Practices;
- Creating Outdoor Demonstration Projects; and
- Other Initiatives.

Y-12/NNSA partners with ORNL regarding stewardship responsibilities for lands on the ORR. Y-12 requires extensive use of erosion controls in construction projects (e.g., use of settling ponds and storm water detention areas), minimal use of water for irrigation, and use of trees where possible to provide shade for energy conservation. Active environmental compliance and preservation programs, such as an ongoing sitewide Pollution Prevention Program, Storm Water Pollution Prevention Plan activities, and policies requiring minimal use of pesticides and fertilizers also minimize environmental impacts. Additionally, Y-12 has limited its modernization construction to "brownfield" sites, thereby preserving ORR greenfield space.

ORNL has various ongoing programs and initiatives that involve or facilitate environmentally and economically beneficial landscaping practices. These include incorporation of native plants into planning for restoration or landscaping in areas across ORNL; development in 2003 of the ORNL Conceptual Landscape Plan and Design Guidelines, which calls for use of native plant species; use of an internal stream corridor protection effort to encourage the growth of native plants in the

riparian zone surrounding ORNL creeks; use of Native Plant and Invasive Species Workshop held at ORNL in April 2003 to educate planning and landscaping staff; the formation of an interagency Native Grass Working Group; integration of native-plant requirements into facilities-development projects; evaluation of upcoming projects by the ORNL Land and Facilities Use Committee on potential impacts, including impact on natural habitat; creation of an ongoing sitewide Pollution Prevention Program and a Storm Water Pollution Prevention Plan and Program; minimal use of pesticides and fertilizers, and use of organic fertilizers; extensive use of erosion controls in construction projects (e.g., settling ponds and bioretention areas); minimal use of water for irrigation; incorporation of plants into project designs for energy conservation by providing shade, and cooling to paved surfaces; provision of public-awareness interaction on invasive plants, nuisance wildlife, and restoration of native grasses; use of brownfield areas for siting new ORNL developments, when practicable; and implementation of an interagency cooperative agreement on conversion of TVA power-line rights-of-way from fescue grass to native grasses and shrubs.

2.3 APPRAISALS AND SURVEILLANCES OF ENVIRONMENTAL PROGRAMS

Numerous appraisals, surveillances, and audits of ORR environmental activities were conducted during 2003 (see Tables 2.15, 2.16, and 2.17). These tables do not include internal DOE prime contractor assessments for 2003.

2.4 ENVIRONMENTAL PERMITS

Table 2.18 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 NOV from TDEC and an EPA RCRA inspection report in 2003, for instances of RCRA nonconformances, and one NOV on April 2, 2003, for a NPDES permit nonconformance that occurred at storm water discharge Outfall 302. The RCRA issues included greater than 1 year storage of land disposal restricted wastes, failure to label a few used oil containers properly, failure to follow the Waste Analysis Plan in the RCRA permits, failure to maintain the required training records for operators of permitted units, and failure to identify/manage potassium ferricyanide and potassium ferrocyanide as hazardous wastes. ORNL provided response correspondence to TDEC as to causes and corrective measures for each accepted nonconformance. However, ORNL contested the cyanide issue and TDEC ultimately agreed that it was not a violation. The other RCRA NOVs resulted in a fine of $10,800 being levied by the state of Tennessee. The NPDES NOV was for a permit nonconformance that occurred at storm water discharge Outfall 302. A leak in a supply pipe was found at the 3544 wastewater treatment facility; it was releasing sodium hydroxide to the Outfall 302 storm drain pipe. The leak was repaired, and Outfall 302 pH measurement returned to normal.

Three NOVs were issued by TDEC in 2003 for ETTP operations. On February 18, 2003, an NOV was issued for NPDES permit limit exceedances of the total petroleum hydrocarbons parameter occurring during prior years at the Central Neutralization Facility. An in-depth investigation was performed by the operating subcontractor for the Central Neutralization Facility, and a summary report was submitted. No definitive cause for the exceedance was identified.

On March 4, 2003, an NOV was issued by the TDEC for two violations of RCRA waste management requirements. One of the issues was the improper labeling of four drums of used oil at the ETTP garage, and the other issue was the failure to update the name of the emergency coordinator on the Central Neutralization Facility

Table 2.15. Summary of environmental audits and assessments conducted at the Y-12 Complex, 2003[a]

Date	Reviewer	Subject	Issues
		BWXT Y-12	
3/20/2003	City of Oak Ridge	Pretreatment Inspection	0
5/7/2003	EPA-Region 4	Purification Facility Construction Site PCB Inspection	0
7/11/2003	TDEC & EPA	TDEC—Underground Storage Tank Compliance Inspection (OST VMF)	0
7/11/2003	TDEC & EPA	TDEC—Underground Storage Tank Compliance Inspection (Y-12 Complex)	0
7/14/2003	TDEC	Review of Building 9720-82 Hollow Fill Project	0
7/16/2003	TDEC	TDEC - Surprise Hazardous Waste Inspection of Analytical Chemistry Union Valley Facility	0
8/19/2003	TDEC	Rad Health Site Visit	0
9/10/2003	City of Oak Ridge	Sanitary Sewer Pretreatment Inspection	0
11/3/2003	TDEC	TDEC Annual RCRA Inspection	1
11/19/2003	TDEC	TDEC Air Permit Site Visit - Y-12 Steam Plant	0
12/9/2003	EPA & TDEC	EPA RCRA Inspection	0
		Bechtel Jacobs Company	
1/29	TDEC/DOE-O	Inspection of Landfills	0
11/3	TDEC	RCRA Inspection	7

[a]Abbreviations

EPA	U.S. Environmental Protection Agency
OST VMF	Office of Secure Transportation Vehicle Maintenance Facility
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	TDEC/DOE-Oversight Division
TSD	Technical Services Division

contingency plan (the coordinator had recently retired). Both issues were corrected to the satisfaction of the TDEC.

On April 11, 2003 an NOV was issued by the TDEC for a CAA permit exceedance that had occurred at the TSCA Incinerator at ETTP during a series of trial burn tests in 2001. In one of the 2001 tests, particulate emissions rates exceeded permit limits. DOE has submitted a proposed schedule of corrective actions. In the other two instances, TDEC alleges that lead and volatile organic compound emissions exceeded permit limits. However, DOE has challenged these allegations based upon the data submitted to the TDEC in the RCRA/TSCA Trial Burn Report.

BWXT Y-12 received an alleged NOV from TDEC on December 11, 2003, for violation of the Tennessee Hazardous Waste Permit (TNHW)-084. The presence of cracks in the floor at a permitted RCRA storage unit (9720-12) was observed during the TDEC inspection in November 2003. TDEC maintained that the cracks violate the permit requirements for the storage area. However, only solid materials are stored in this unit, and the permit does not allow storage of liquids nor require secondary containment since liquid spills cannot occur. To resolve the issue, a Class I permit modification was initiated to note the presence of cracks in the floor of the storage unit. BWXT Y-12's permit modification also clarifies the permit language for other storage units that store only solids, to assure that this issue does not come up again at other storage units.

Table 2.16. Summary of environmental audits and assessments conducted at ORNL, 2003[a]

Date	Reviewer	Subject	Issues
		UT-Battelle	
1/9	TDEC	Site visit for inspection of Aquatic Resource Alteration Permit and Construction Activity Storm Water Permitting on East Campus	0
6/24-6/25	EPA	CAA inspections	0
9/29-10/1	TDEC/DOE-O	CAA inspections	0
		Bechtel Jacobs Company	
5/6	TDEC	RCRA inspection	1
5/29	TDEC	RCRA inspection of waste inventories	0
6/23-6/27	TDEC/DOE-O/EPA	Multimedia inspection	0
9/11	FERC	Inspection of White Oak Dam	0

[a]Abbreviations

CAA	Clean Air Act
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	TDEC/DOE-Oversight Division

Table 2.17. Summary of environmental audits and assessments conducted at the ETTP, 2003[a]

Date	Reviewer	Subject	Issues
1/16	TDEC	Clean air inspection	0
2/19	TDEC	RCRA inspection (permitted storage areas)	2
2/27	TDEC	Title V annual air inspection	0
4/28	TDEC	RCRA inspection CNF and K-1414 garage	0
5/6	EPA	RCRA inspection of TSCA Incinerator	2
7/10	EPA	UST inspection at K-1414 garage	0

[a] Abbreviations

CNF	Central Neutralization Facility
EPA	U.S. Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
TSCA	Toxic Substances Control Act
UST	underground storage tank

Table 2.18. Summary of permits as of December 2003

	Y-12 Complex	ORNL	ETTP
Resource Conservation and Recovery Act (RCRA)			
RCRA operating (Parts A and B)	4[a]	2[b]	3
Part B applications in process	0[c]	1	0
Postclosure	3[d]	0	0
Solid waste landfills	6[e]	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[f]	1[f]	1[f]
Clean Water Act			
National Pollutant Discharge Elimination System (NPDES)	1[g]	1	4
Storm water	1[h]	1[h]	1[h]
Aquatic resource alteration	1	2	1
U.S. Army Corps of Engineers 404 permits	0	0	1
General storm water construction	2[i]	7	0
Clean Air Act			
Operating	32	11	8
Construction	1	1	2
Prevention of significant deterioration	0	0	0
Sanitary Sewer			
Sanitary sewer	1	0	0
Pump-and-haul permit	2[j]	0	2
Toxic Substances Control Act (TSCA)			
TSCA Incinerator	0	0	1
Research and development for alternative disposal methods	0	0	0
Safe Drinking Water Act			
Class V underground injection control permits	0	0	0

[a]Four permits have been issued, representing 13 active units.

[b]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.

[c]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.

[d]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.

[e]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.

[f]Oak Ridge Reservation (ORR) permit. Requirements for corrective action have been integrated into the ORR Federal Facility Agreement.

[g]Issued 4/28/95 and effective 7/1/95. TDEC has incorporated requirements for storm water into individual NPDES permits.

[h]TDEC has incorporated into individual NPDES permits.

[i]Notice of intent that accesses a general NPDES permit. A notice of intent remains on file for construction at Landfills V and VII and for construction of the Purification Facility.

[j]This includes one Pump-and-Haul Permit for Y-12 and one at Clark Center Park which is operated by East Tennessee Mechanical Contractors.

2.6 TENNESSEE OVERSIGHT AGREEMENT

The Tennessee Oversight Agreement is a voluntary agreement entered into between 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 in verifying 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) and is available on the web at http://www.state.tn.us/environment/doeo/.