

10 Oak Ridge Reservation - Year Site Plan

July 2007

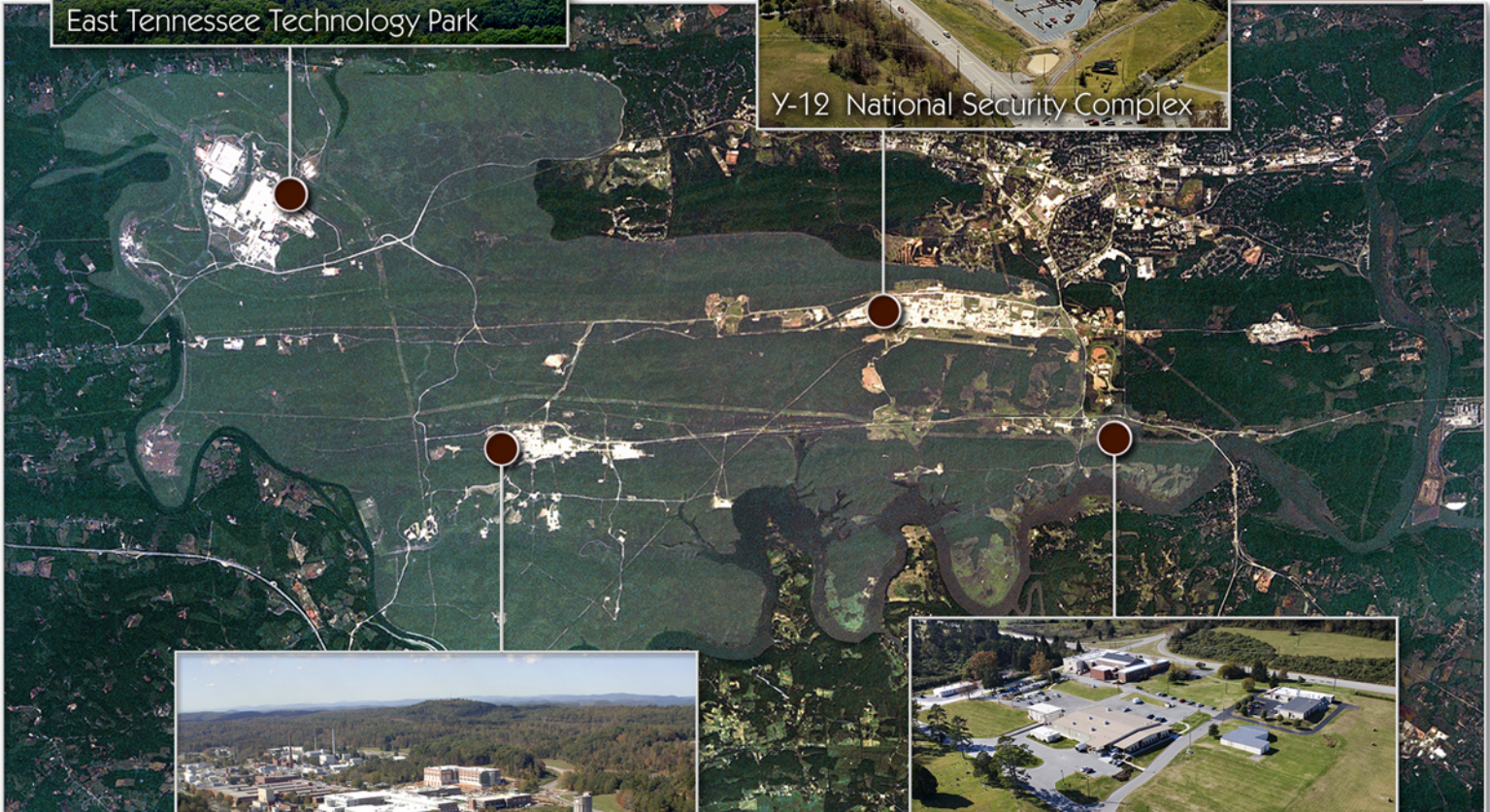
Integrating Multiple
Land Use Needs



East Tennessee Technology Park



Y-12 National Security Complex



Oak Ridge National Laboratory



Oak Ridge Institute for
Science and Education

DOE/ORO-TYSP2007

Prepared by
Oak Ridge Office
U.S. Department of Energy

DOCUMENT AVAILABILITY

Reports produced after January 1, 1996, are generally available free via the U.S. Department of Energy (DOE) Information Bridge.

Web site <http://www.osti.gov/bridge>

Reports produced before January 1, 1996, may be purchased by members of the public from the following source.

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Telephone 703-605-6000 (1-800-553-6847)
TDD 703-487-4639
Fax 703-605-6900
E-mail info@ntis.gov
Web site <http://www.ntis.gov/support/ordernowabout.htm>

Reports are available to DOE employees, DOE contractors, Energy Technology Data Exchange (ETDE) representatives, and International Nuclear Information System (INIS) representatives from the following source.

Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
Telephone 865-576-8401
Fax 865-576-5728
E-mail reports@osti.gov
Web site <http://www.osti.gov/contact.html>

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Oak Ridge Reservation Ten-Year Site Plan: Integrating Multiple Land Use Needs

July 2007

Prepared by
Oak Ridge Office
U.S. Department of Energy

Contents

LIST OF FIGURES.....	v
ACRONYMS AND ABBREVIATIONS.....	vii
EXECUTIVE SUMMARY	ix
1. INTRODUCTION	1
1.1 REGIONAL SOCIOECONOMIC IMPACT.....	2
1.2 ADJACENT LAND USE AND PHYSICAL CHARACTERISTICS	2
1.3 SCOPE OF THE ORR TEN-YEAR SITE PLAN.....	3
1.4 DOE-ORO PLANNING PROGRAM	3
2. OAK RIDGE RESERVATION SITE SUMMARY.....	7
2.1 HISTORY	7
2.2 SUMMARY OF LAND CONVEYANCES	7
3. PROFILES OF DEPARTMENT OF ENERGY ACTIVITIES.....	11
3.1 EAST TENNESSEE TECHNOLOGY PARK.....	11
3.2 NATIONAL NUCLEAR SECURITY ADMINISTRATION, Y-12 SITE OFFICE	11
3.3 OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION.....	15
3.4 OAK RIDGE NATIONAL LABORATORY	15
4. PHYSICAL CHARACTERISTICS AND NATURAL RESOURCES	19
5. CURRENT LAND AND FACILITIES USE.....	21
5.1 EMERGENCY RESPONSE.....	21
5.2 NATIONAL ENVIRONMENTAL RESEARCH PARK.....	22
5.3 FIELD RESEARCH AREAS	23
Environmental Research.....	23
Energy Research.....	23
SensorNet	24
5.4 CONTAMINATED SITES AND REMEDIATION	24
5.5 COMPLIANCE AND MONITORING	26
5.6 WILDLIFE MANAGEMENT	28
5.7 CONSERVATION EASEMENT.....	28
5.8 LAND APPLICATION OF BIOSOLIDS	28
5.9 CULTURAL AND HISTORIC RESOURCES	29
5.10 WILDLAND FIRE PREVENTION AND RESPONSE	29
5.11 ECOSYSTEM MANAGEMENT ACTIVITIES.....	31
5.12 ORR INFRASTRUCTURE.....	32
Communications Towers.....	32
Roads.....	32
Utilities	32
5.13 PUBLIC AREAS.....	33
6. DOE VISION AND MISSION FOR THE ORR: THE BASIS FOR THE PLANNING PROCESS.....	35
6.1 ORR VISION.....	35
6.2 ORR MISSION ACTIVITIES.....	36
6.3 LAND USE DESIGNATIONS ON THE ORR.....	36
7. THE ORR PLANNING PROCESS	39

7.1	PLANNING GOALS	39
7.2	LAND USE PRIORITIES	39
7.3	REVIEW PROCESS AND PARTICIPANTS	39
	The Oak Ridge Reservation Management Team	40
	Reservation Management Coordinator	40
	Contractor Interface Team	40
	Community Attitudes and Stakeholder Involvement	40
8.	RESERVATION MANAGEMENT OPERATING BUDGET	41
9.	ORR FUTURE LAND AND FACILITY USE PLANNING	43
9.1	FIELD RESEARCH AREAS AND FACILITIES	43
	Aquatic-Terrestrial Interface Studies	43
	Detection and Simulation of Ecosystem Response	45
	Ecological Field Station	45
	National Ecological Observatory Network	45
	National Transmission Technology Research Center Facilities (Power Delivery Research Center)	45
	SensorNet	45
	Old-Field Succession Free Air CO ₂ Enrichment (FACE) Experiment	46
9.2	ENVIRONMENTAL COLLABORATION AREAS	46
9.3	FUTURE INITIATIVES	47
9.4	ENVIRONMENTAL MANAGEMENT AND LONG-TERM STEWARDSHIP	47
9.5	ENHANCEMENT OF AREA ECONOMIC DEVELOPMENT	48
10.	SUMMARY OF PLANNED ACTIONS	51
10.1	NEAR-TERM ACTIONS	51
10.2	FIVE-YEAR ACTIONS	51
10.3	LONG-TERM ACTIONS	51
	REFERENCES	53

List of Figures

1	Location of the Oak Ridge Reservation.	1
2	Options analysis map for land use planning initiative.....	5
3	Regional land use map prepared from a 1984 Landsat Thematic Mapper image.	8
4	Original and current ORR boundaries.....	9
5	Locations of DOE facilities on the ORR.....	12
6	East Tennessee Technology Park.....	14
7	Y-12 National Security Complex.....	14
8	Oak Ridge Institute for Science and Education, South Campus.....	16
9	Oak Ridge National Laboratory.....	17
10	ORR physical and natural resources.....	19
11	ORR land management and operational uses.....	21
12	ORR emergency response areas.....	22
13	Categories of Oak Ridge National Environmental Research Park users in 2006.....	23
14	Environmental research areas on the ORR.....	24
15	Types of environmental research on the ORR.....	25
16	Current interface of federal facilities and cleanup areas.....	27
17	Historic and cultural resources on the ORR.....	30
18	ORR road infrastructure, including wildland fire road grid.....	31
19	Land use designations on the ORR.....	37
20	Future new land uses and facilities on the ORR.....	44
21	ORR physical and surface interface for risk-based end state plan.....	49

Acronyms and Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CIP	comprehensive integrated planning
CROET	Community Reuse Organization of East Tennessee
DECC	Distributed Energy Communications and Controls
DOE	U.S. Department of Energy
EM	Environmental Management Program (DOE)
EPA	U.S. Environmental Protection Agency
ERA	emergency response area
ETTP	East Tennessee Technology Park
FACE	Free Air CO ₂ Enrichment
FY	fiscal year
NEON	National Ecological Observatory Network
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSA	National Nuclear Security Administration
NSF	National Science Foundation
NTTRC	National Transmission Technology Research Center
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Office (DOE)
ORR	Oak Ridge Reservation
ORRMT	Oak Ridge Reservation Management Team
R&D	research and development
ROD	Record of Decision
SNS	Spallation Neutron Source
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
TYSP	Ten-Year Site Plan
UTK	University of Tennessee at Knoxville
WBW	Walker Branch Watershed
YSO	Y-12 Site Office

Executive Summary

The Oak Ridge Reservation (ORR) is a unique resource for the U.S. Department of Energy (DOE) in addressing its technology and national science missions. DOE's Oak Ridge Office (ORO) is committed to protecting its land inventory to meet the requirements of existing and future DOE mission-related facilities and programs. Protection of the land, facilities, and the environment is also necessary to ensure continuing benefits and economic growth for the region through enhanced DOE missions. Thus, land use decision-making is a crucial factor in assuring the viability and availability of land necessary to accomplish those missions (DOE 2003).

The ORR Ten-Year Site Plan (TYSP) addresses planning for the ORR overall, but more specifically addresses reservation land outside developed site areas and facilities. Other documents address site- or facility-specific TYSP requirements. There will be overlap of information presented. The ORR TYSP closely follows and references the document *Comprehensive Integrated Planning Process for the Oak Ridge Operations Sites* (CIP 1999) and integrates updated ORR land use planning information.

The ORR is home to three major facility complexes: East Tennessee Technology Park (ETTP), the National Nuclear Security Administration's Y-12 National Security Complex, and Oak Ridge National Laboratory (ORNL). Also located in the city of Oak Ridge are the Oak Ridge Institute for Science and Education (ORISE) and the American Museum of Science and Energy. ORO is responsible for programs at ETTP, ORISE, and ORNL. The 33,718-acre reservation is located in Roane and Anderson Counties in East Tennessee, mostly within the corporate limits of Oak Ridge. Satellite imagery shows that the ORR is a large and nearly continuous island of forest within a landscape that is fragmented by urban development and agriculture.

For more than 60 years, government missions and operations have been the primary factor in

development of the ORR complex. From 1942 through 1948, the federal government acquired approximately 54,998 acres to build facilities for large-scale production of fissionable material for the world's first nuclear weapons. After 1948, an additional 3,584 acres were acquired for related mission needs. Of the original 58,582 acres, 24,864 acres have been transferred, with 33,718 acres remaining as the ORR.

The land on the ORR is used intensively for multiple purposes to meet the mission goals and objectives of DOE. Uses of the land area surrounding the developed sites include safety, security, and emergency planning zones; research and education; cleanup and remediation sites; environmental regulatory monitoring; wildlife management; biosolids land application; protection of cultural and historic resources; wildland fire prevention; land stewardship activities; reservation infrastructure; and public areas.

The combination of a large land area with complex physical characteristics and diverse natural resources has provided a critical foundation for supporting DOE's environmental research mission, as well as the ability to build leading-edge facilities such as the Spallation Neutron Source.

Future uses of the ORR will, in most cases, expand and build on current land uses, not replace them. Future uses include field research areas and facilities (environmental research, security and monitoring systems); environmental management and long-term stewardship areas (remediated, restored, and protected contaminated areas); infrastructure improvements (communications, utilities); land responsibility actions (emergency response, wildland fire prevention and response, conservation easements); integrated management of natural resources; and additional public and educational opportunities (greenways, stakeholder involvement). Current land and facility uses are expected to continue.

1.1 Regional Socioeconomic Impact

Significant contributions resulting from DOE's presence in Oak Ridge have been evident to the state of Tennessee, local residents, and local governments. In 1999, the Center for Business and Economic Research at the University of Tennessee started conducting in-depth analyses of the annual economic benefits for Tennessee attributable to DOE operations (CBER 2007). Results of the study for fiscal year (FY) 2006 demonstrate the role of DOE as a major contributor to the Tennessee economy.

Key findings for FY 2006 include the following:

- Spending by DOE and its contractors led to an increase of nearly \$3.6 billion in the state gross domestic product of Tennessee in 2006.
- Total personal income generated in Tennessee by DOE-related activities was nearly \$2.0 billion in 2006. Each dollar of income directly paid by DOE in the state translates to a total of \$2.10 in personal income for Tennessee residents.
- DOE spending supported 44,889 full-time jobs in the state in 2006, meaning that for every DOE job, 3.8 additional jobs were supported in other sectors of the state economy.
- DOE-related spending generated \$76.9 million in state and local sales tax revenue in Tennessee in 2006.
- DOE operations continue to rely on a highly trained and educated workforce. In 2006, 999 employees held a Ph.D. degree; 1,757 held a master's degree; and 3,154 held a bachelor's degree.

DOE and its major contractors¹ provided 11,914 full-time jobs in Tennessee in 2006. The

¹ BWXT Y-12, LLC; UT-Battelle, LLC; Oak Ridge Associated Universities; Bechtel Jacobs Company, LLC; Wackenhut Services, Inc.; DOE Office of Scientific and Technical Information; DOE Oak Ridge Office; DOE/NNSA Site Office; and other DOE field offices.

jobs are relatively high-wage jobs, with annual wages and salaries totaling \$763.2 million.

Total non-payroll spending (or direct procurement spending) by DOE and its contractors totaled more than \$982 million in 2006. Non-payroll spending generates millions of dollars in new income and supports thousands of jobs in a wide array of sectors in Tennessee's economy.

In 2006, the total state sales tax attributed to DOE was \$21.6 million. As a result of DOE and contractor purchases of goods and services in Tennessee, \$16 million and \$5.6 million were directly contributed to the public coffers of state and local governments, respectively.

Many of the benefits from DOE's presence in Tennessee are not easily quantified but have a broad and positive impact on the state, as demonstrated by the following examples:

- DOE, its contractors, and their employees donated over \$5.7 million in charitable contributions, community grants, and equipment bequests to organizations across Tennessee in 2006.
- In FY 2006, more than 3,000 visits by guest researchers generated approximately 18,600 overnight stays in the Knoxville–Oak Ridge area.
- The American Museum of Science and Energy drew nearly 102,041 visitors during FY 2006.

1.2 Adjacent Land Use and Physical Characteristics

Land uses near the ORR are predominantly rural, with agricultural and forest land dominating. The residential areas of the city of Oak Ridge that abut the ORR are primarily along the northern and eastern boundaries of the reservation. Some Roane County residents have homes adjacent to the western boundary. The Clinch River forms a boundary between Knox County, Loudon County, and portions of Roane County. The topography, geology, hydrology, vegetation, and wildlife of the ORR provide a

complex and intricate array of resources that directly impact land stewardship and land use decisions. The area's ridge and valley topography, with moderate to severe slopes, provides security and isolation for the ORR.

The hydrology of the ORR is complex. Highly fractured interbedded shale-limestone units predominate, and karst features are prevalent in some areas. Protecting groundwater quality on the ORR is extremely important to ensure that potential contamination does not spread to the surrounding region.

The ORR is mostly contiguous native eastern deciduous forest. This large, relatively unfragmented area of mature eastern deciduous hardwood forest (with many forest blocks larger than 100 acres) provides habitat for numerous wildlife species. Such blocks of forested area are increasingly uncommon in the Ridge and Valley Province. The resulting diversity of plant and wildlife species ranges from common species found in urban and suburban areas of eastern Tennessee to species with more restrictive requirements. Many species of wildlife and plants that are now uncommon in Tennessee can be found on the ORR.

Information on physical characteristics and natural resources constitutes critical data in land use decision-making. The document *Oak Ridge Reservation Physical Characteristics and Natural Resources* (Parr and Hughes 2006) includes information on ORR topography, geology, hydrology, vegetation (including forest resources), wildlife, wetlands, cultural resources, and special designations.

1.3 Scope of the ORR Ten-Year Site Plan

The 2007 ORR Ten-Year Site Plan (TYSP) updates the 2006 ORR TYSP. It addresses planning for the ORR overall, but more specifically addresses reservation land outside of developed site areas and facilities. Other documents address site- or facility-specific TYSP requirements. The information presented in these documents will overlap. ORR land use planning

is described in the document *Comprehensive Integrated Planning Process for the Oak Ridge Operations Sites* (ORNL 1999) available at http://home.ornl.gov/general/facility_plans/cip/cip.htm, and the land use planning information is updated in this 2007 ORR TYSP. The ORR land use planning-process document is currently being updated and will be incorporated into the 2008 ORR TYSP as an appendix and also be available on the Web.

1.4 DOE-ORO Planning Program

The ORR planning effort has been ongoing, with significant stakeholder involvement, for several years. It began in earnest in the mid-1990s with the Common Ground program, which looked at the interaction of DOE-ORO and its stakeholders in land use planning for the ORR. This effort provided significant data used in subsequent planning efforts.

During this period all ORR planning was done by Lockheed Martin Central, which maintained a planning staff of 43 planners and support staff with a budget of a little over \$2 million annually. This staff was dramatically reduced following the separation of contracts for the three Oak Ridge installations [Oak Ridge National Laboratory (ORNL), the Y-12 Site, and East Tennessee Technology Park (ETTP)].

The comprehensive integrated planning (CIP) document was created as a response to the requirements contained within DOE Order 430.1, Life Cycle Asset Management (LCAM). LCAM also resulted in the secretarial policy statement, DOE Policy 430, clarifying the need for stakeholder involvement and input. The DOE-ORO planning document, *Comprehensive Integrated Planning: A Process for the Oak Ridge Reservation* (CIP 1998), was given the Federal Planning Program Excellence Award for 1998 by the American Planning Association.

During 2002 DOE used a land use planning focus group and public input to seek recommendations in developing a set of possible scenarios for portions of the ORR that may in the future

no longer be needed for DOE missions. The possible excess consisted of DOE land in the northwest portion of the reservation, excluding the ETTP site. The focus group, consisting of 20 individuals with expertise ranging from economic development to community needs to environmental quality and protection, took into consideration the input from participants at public meetings and agreed on potential land uses for 87% of the land under consideration (Fig. 2). Of the remaining 13%, four different use options were considered, and a technical evaluation was performed to determine potential impacts on various resources if the area was utilized according to the four scenarios. The results were published in the *Land Use Technical Report* (ORNL 2002a) and the *Final Report of the Oak Ridge Land Use Planning*

Focus Group (Focus Group 2002). Detailed information on the process and results are available on the ORR Land Use Planning web site at <http://landuseplanning.ornl.gov/>.

DOE Order 430.1B, Real Property Asset Management (RPAM), the latest effort in the DOE planning and asset management effort, requires the development of a TYSP to gather information on all aspects of DOE sites, including both land use plans and facilities and maintenance issues. These TYSPs will enable DOE Headquarters to better understand the issues at each site within the DOE complex. These documents will be updated annually to support budget and activity proposals.

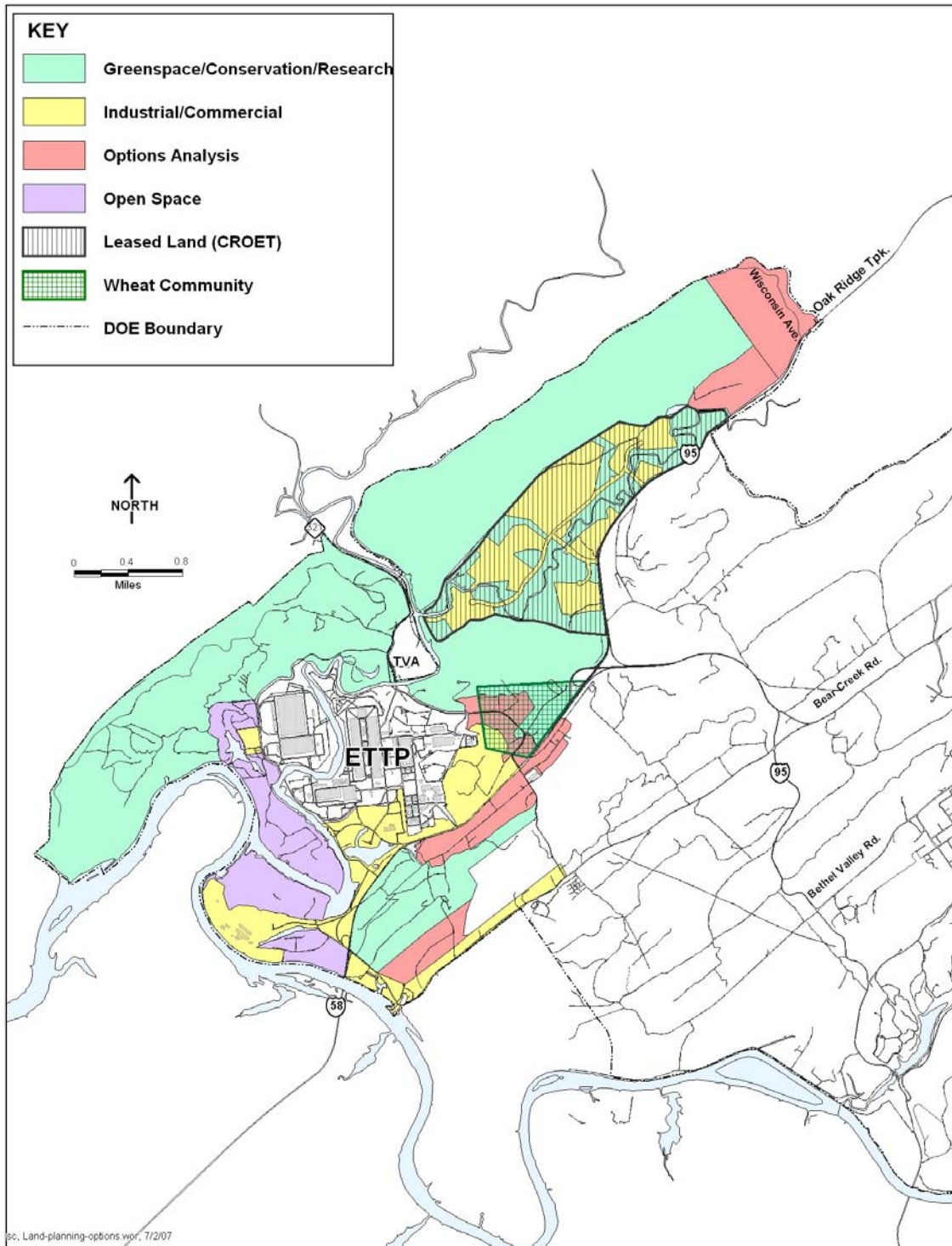


Fig. 2. Options analysis map for land use planning initiative.

2. Oak Ridge Reservation Site Summary

The DOE Oak Ridge facilities are rich in history, dating back to the 1940s, when the facilities played a major role in the production of materials as part of the World War II Manhattan Project.

2.1 History

For more than 60 years, government missions and operations have been the primary factor in the development of the Oak Ridge installations. In the early 1940s, the U.S. government purchased approximately 58,575 acres to build facilities for large-scale production of fissionable material for the world's first nuclear weapons. In 1943, construction began on the X-10 nuclear research facility [now the multi-purpose research and development (R&D) facility called Oak Ridge National Laboratory], the first uranium enrichment facility (now the Y-12 National Security Complex), and a gaseous diffusion enrichment facility (currently being reindustrialized as East Tennessee Technology Park). By mid-1945, "the city behind the fence," so-called because of the extensive use of security checkpoints and fences on the ORR, had a population of 75,000; and employment at the three installations had reached its peak of 82,000. With the end of World War II in September 1945, the population of Oak Ridge began to decline as people began returning to prewar occupations.

A summary of management changes on the ORR from 1947 to 1999 is described in the 1999 CIP process report (CIP 1999). From 1942 through 1948, the federal government acquired approximately 54,998 acres to build facilities for large-scale production of fissionable material for the world's first nuclear weapons. After 1948, an additional 3,584 acres were acquired for related mission needs. Of the total 58,582 acres, 24,864 acres have been transferred, with 33,718 acres remaining as the ORR.

The ORR is located within Anderson and Roane Counties, Tennessee. Most of the ORR is within the corporate limits of the city of Oak Ridge, Tennessee, and is located approximately 2 miles southwest of the population center of Oak Ridge. The ORR is bordered on the north and east by the population center of the city of Oak Ridge and on the south and west by the Clinch River/Melton Hill Lake impoundment. From a satellite photo, it is clear that the ORR is a large and nearly continuous island of forest within a landscape that is fragmented by urban development and agriculture (Fig. 3).

2.2 Summary of Land Conveyances

DOE, its predecessor agencies (the Atomic Energy Commission and the Energy Research and Development Administration), and its major contactors have always worked closely with the city of Oak Ridge and organizations within Oak Ridge associated with economic development to assist in their attempt to attain self-sufficiency. This assistance has taken many forms, from direct and indirect land transfers to financial payments, facility and infrastructure transfers, and planning assistance.

Of the total 58,582 acres acquired for the ORR, 24,864 acres have been transferred, with 33,718 acres remaining as the ORR (see Fig. 4). Of the 24,864 acres, approximately 6,049 acres (24%) were conveyed directly to the city of Oak Ridge. DOE's historical support has included the following land transfers:

- 16,855 acres for residential, commercial, and community development;
- 1,031 acres to federal agencies and for transportation easements;
- 9,626 acres for preservation and recreation;
- 4,247 acres for industrial development; and
- 11 acres for mission-related purposes.

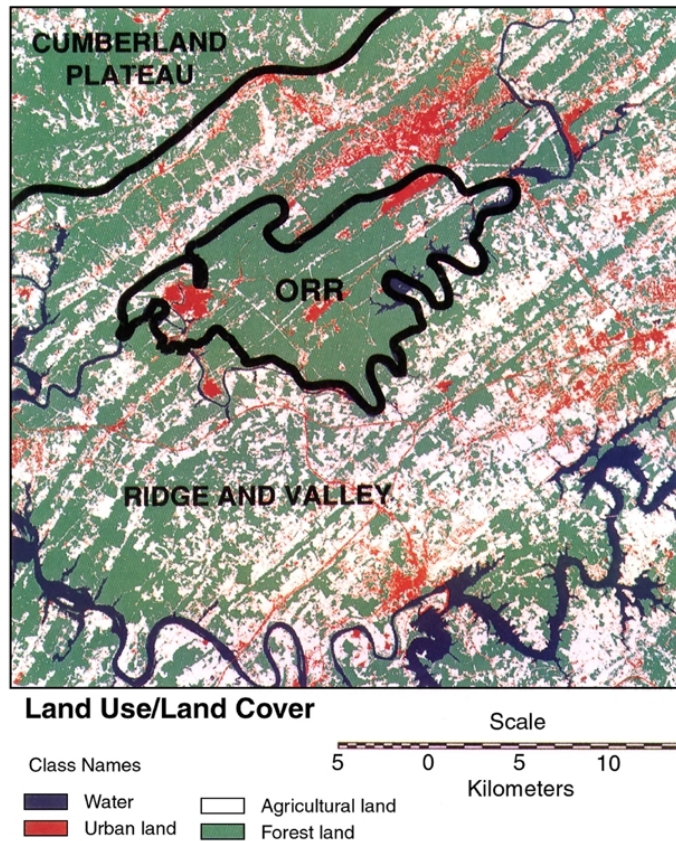


Fig. 3. Regional land use map prepared from a 1984 Landsat Thematic Mapper image.

Current land grants are

- 2,920 acres for the Three Bend permit,
- 2,966 acres for the Black Oak Ridge Conservation Easement, and
- 468 acres for the lease for the ED-1 Natural Areas.

In addition, in 1967, the Atomic Energy Commission transferred at no cost 778 acres to the Tennessee Valley Authority (TVA), which in turn gave the land to the city of Oak Ridge to use for recreational or park development. In 1968, the same mechanism was used to transfer an additional 1,364 acres to TVA at no cost with the stated purpose of industrial development in cooperation with the city of Oak Ridge, involving the city in marketing and developing the land.

ORO has long been aware of its responsibilities for maintaining a strong partnership with Oak Ridge city officials and with the public to meet the ongoing needs of the community and region both economically and environmentally. ORO has met this responsibility in part by using its real estate resources to support the community's needs in a multidimensional manner—e.g., by working directly with the city of Oak Ridge; with the Community Reuse Organization of East Tennessee (CROET), which the city supports; with community agencies such as the Boys Club; with the regional medical center in Oak Ridge; and with the state of Tennessee for certain preservation and recreation initiatives. All of these actions are supportive of the overall well-being of the community, while at the same time ensuring a viable and strong DOE presence in the community.

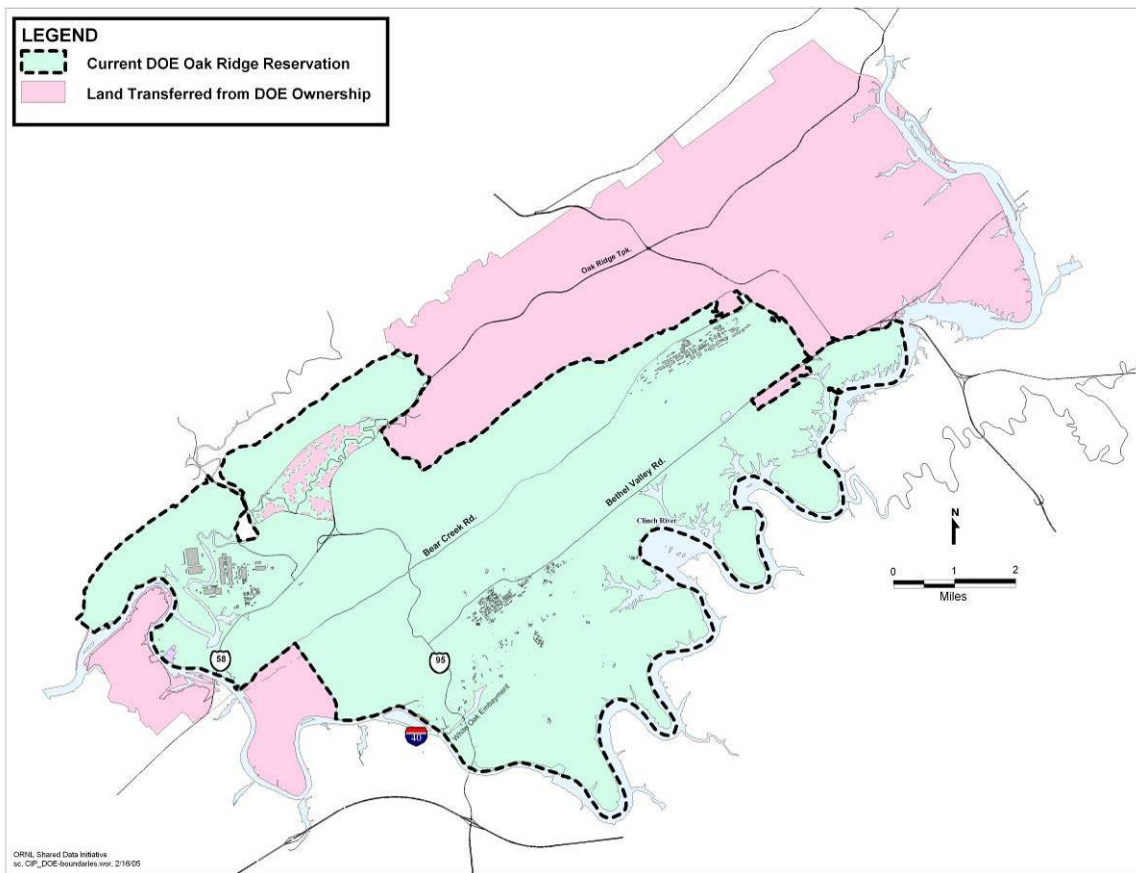


Fig. 4. Original and current ORR boundaries.

Recent and current actions continue to underscore ORO’s strong commitment to a community partnership. DOE’s ongoing mission needs are carefully scrutinized and judicially balanced before granting realty interests to the public and private sector that would either end or encumber DOE’s rights for continued operations.

Current and recent initiatives have included

- transfers to CROET for business development (Heritage Center, Horizon Center);
- land transfers to the city for residential development [Parcel A; shoreline property of O segment; Wisconsin Road area/Parcel ED-6 (ongoing)];
- conservation easement of 2,966 acres on Black Oak Ridge;
- recreational development (three public greenways; Clark Center Park);
- transfer of 2,920 acres for wildlife preservation (Three Bend Scenic and Wildlife Refuge);
- transfer of excess 4 acres and facility on Vance Road to Methodist Medical Center;
- transfer of property at 55 Jefferson Avenue to Boys Club of Oak Ridge; and
- ongoing negotiations with the American Museum of Science and Energy Foundation on the transfer of Parcel G, Parcels 279.01 and 483, and the American Museum of Science and Energy.

3. Profiles of Department of Energy Activities

DOE is present in Oak Ridge in three distinct capacities: (1) the ORO, which is one of DOE's major field offices; (2) the Y-12 Site Office (YSO) of the National Nuclear Security Administration (NNSA), an independent agency of DOE; and (3) the Office of Scientific and Technical Information, which is part of the DOE Headquarters Office of Science.

DOE's 33,718-acre ORR is home to three major facility complexes: ETTP, the NNSA Y-12 National Security Complex, and ORNL. Also located in the city of Oak Ridge are the Oak Ridge Institute for Science and Education (ORISE) and the American Museum of Science and Energy. ORO is responsible for programs at ETTP, ORISE, and ORNL. Figure 5 shows the locations of DOE facilities.

3.1 East Tennessee Technology Park

East Tennessee Technology Park (ETTP), also known as the Heritage Center, is the home of the former gaseous diffusion plant known as K-25 and is a primary focus for DOE's Environmental Management and Reindustrialization Programs (Fig. 6). Cleanup of ETTP and conversion of a portion of the site to a private industrial park is an important mission for DOE. Under DOE's cleanup approach, the department will be demolishing most of the facilities at the site and will be ensuring that the soil and groundwater are remediated to safe levels for industrial use. The cleanup is managed for DOE by Bechtel Jacobs Company, LLC, which both performs and subcontracts work.

Reindustrialization is integral to DOE's strategy to accomplish cleanup at ETTP. The focus of the Reindustrialization Program is to transfer facilities and land to CROET. The transferred facilities will become integral to the Heritage Center—the industrial park that is being developed by CROET. Work is progressing on the establishment of Phase I of the Heritage

Center. This phase includes the transfer of roughly 15 buildings and 250 acres of land. Selection of these facilities was based on their historical use, environmental conditions, and marketability. Transferring these facilities will save DOE tens of millions of dollars because the new property owner will be responsible for ultimate demolition of the buildings.

3.2 National Nuclear Security Administration, Y-12 Site Office

As required by the *National Defense Authorization Act for Fiscal Year 2000*, the national security functions and activities performed by certain elements of DOE were transferred to NNSA. Management responsibility for operations at the Y-12 National Security Complex, formerly known as the Y-12 Plant, was transferred to YSO under NNSA. The Jack Case Center (under construction) at the Y-12 National Security Complex is shown in Fig. 7. Y-12 plays an important role in U.S. national security and is a one-of-a-kind facility in the NNSA Nuclear Weapons Complex. Y-12's role includes providing critical elements of NNSA's missions that ensure the safety, reliability, and performance of the U.S. nuclear weapons deterrent; supplying the special nuclear material for use in naval reactors; promoting international nuclear safety and nonproliferation; reducing global dangers from weapons of mass destruction; and supporting U.S. leadership in science and technology. Y-12 also uses its unique capabilities to support the Research Reactor Programs for U.S. and international customers, other federal agencies such as the Department of Defense and Department of Homeland Security, state and local governments, and private-sector companies.

Another mission of long standing is the support of other federal agencies through a complementary work program. Y-12 applies

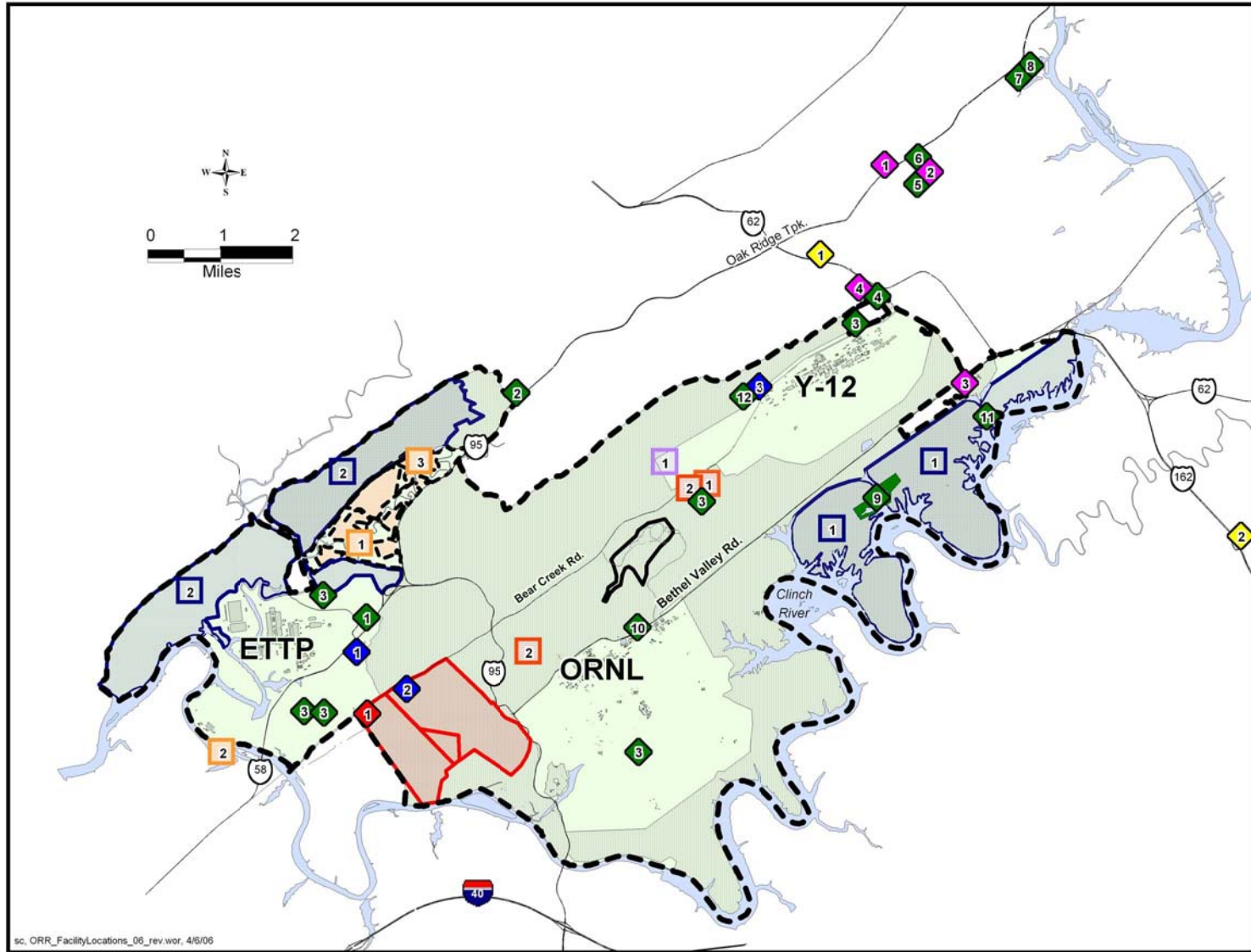
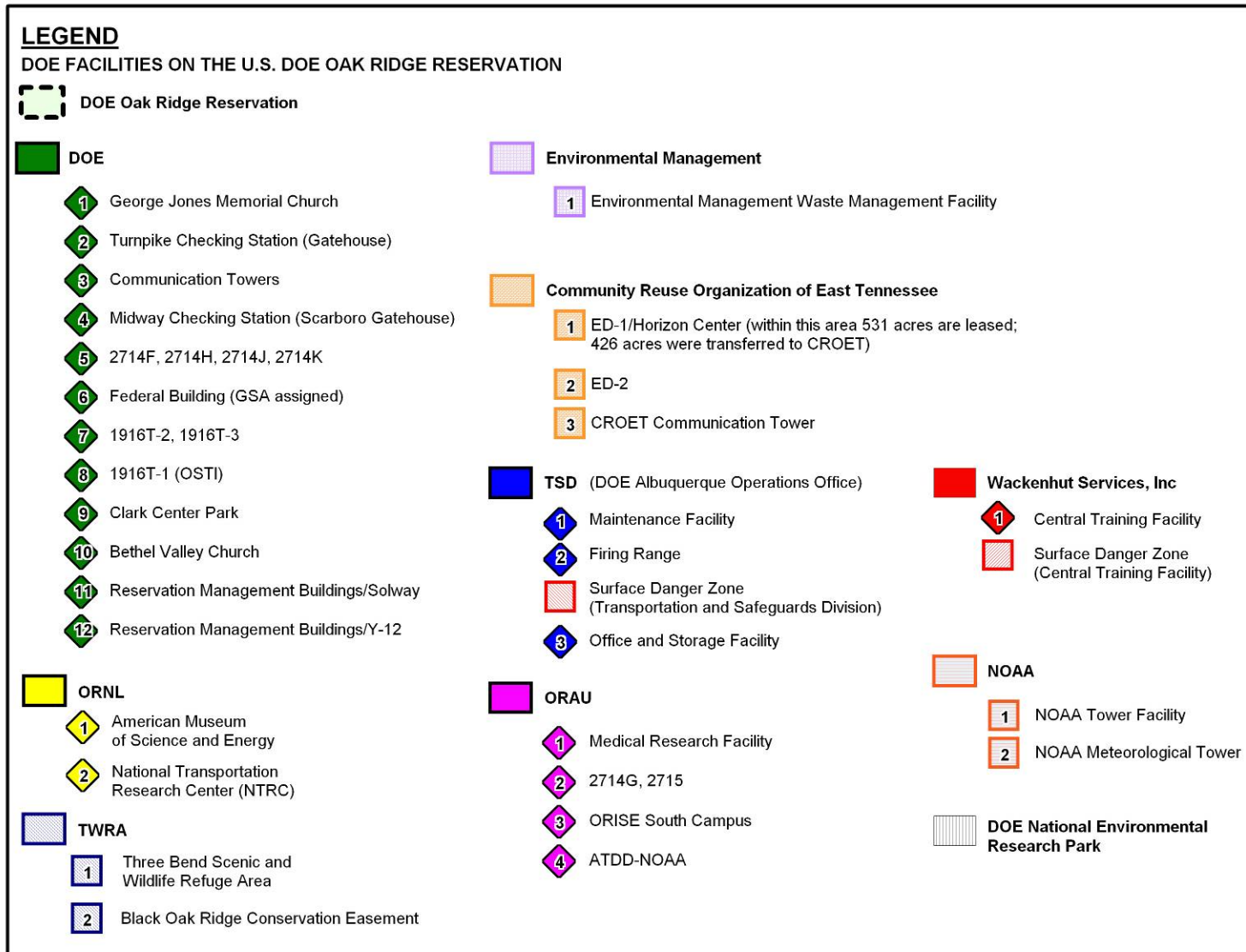


Fig. 5. Locations of DOE facilities on the ORR.



Legend for Fig. 5.



Fig. 6. East Tennessee Technology Park.



Fig. 7. Y-12 National Security Complex.

unique abilities, initially developed for highly specialized military purposes, to a wide range of manufacturing problems to support the capabilities of the U.S. industrial base. Y-12's all-inclusive expertise includes proceeding from concept, through detailed design and specification, to building prototypes and configuring integrated manufacturing processes.

Every weapon in the stockpile has some components manufactured at Y-12.

The Y-12 National Security Complex is operated for NNSA by BWXT Y-12, LLC.

3.3 Oak Ridge Institute for Science and Education

Established as an official DOE institute in 1992, with programs dating back to 1946, ORISE is a national leader in science education and research. Through the management of ORISE, Oak Ridge Associated Universities directly supports DOE's national agenda. ORISE's mission objectives are

- strengthening our nation's research-and-development enterprise through education and research-participation programs;
- ensuring the readiness of our nation to respond to terrorist incidents and other emergencies; and
- protecting workers, the public, and the environment through research, outreach, and verification activities.

Figure 8 shows the ORISE, South Campus located on about 223 acres at the intersection of Bethel Valley and Scarboro roads.

3.4 Oak Ridge National Laboratory

ORNL (Fig. 9) is DOE's largest science and energy laboratory. Managed since April 2000 by UT-Battelle, LLC, a partnership of the University of Tennessee and Battelle

Memorial Institute, ORNL was established in 1943 as a part of the Manhattan Project. During the 1950s and 1960s, ORNL became an international center for the study of nuclear energy and related research in the physical and life sciences. The 1970s led to an expansion of ORNL's research programs into the areas of energy production, transmission, and conservation. Today, under DOE's Office of Science, ORNL has the primary mission focus of conducting research in neutron science, energy, high-performance computing, systems biology, materials science, and national security that will lead to innovative solutions to complex problems. As an international leader in a range of scientific areas supporting DOE's basic research, energy, national security, and environmental missions, ORNL is actively engaged in a broad range of national and international partnerships with industry and educational institutions. As a DOE steward of critical national research infrastructure, the laboratory provides access to university, industry, and government researchers on a competitive basis. The Laboratory is home to 2,478 facility users and visiting scientists every year. The \$1.4 billion Spallation Neutron Source (SNS), completed in 2006, will make ORNL the world's foremost center for neutron science research.

The Laboratory has six core competencies that fall under the programmatic themes in the DOE strategic plan (DOE 2006):

Scientific Discovery and Innovation

- Neutron science, including structure and dynamics of materials in extreme conditions and on nanometer-length scales in soft and hard materials
- Leadership computing and simulation science
- Comprehensive design, synthesis, and characterization of advanced materials and interfacial chemical processes
- Biological and environmental systems

Energy Security

- Engineering sciences, including electric power systems, combustion and thermal engineering, plasma physics, and radiochemical technology

Nuclear Security

- Counterterrorism and nonproliferation detection systems

Details on ORNL's ten-year planning effort are the subject of the 2007 ORNL TYSP (ORNL 2007).



Fig. 8. Oak Ridge Institute for Science and Education, South Campus.



Fig. 9. Oak Ridge National Laboratory.

4. Physical Characteristics and Natural Resources

The topography, geology, hydrology, vegetation, and wildlife of the ORR provide a complex and intricate array of resources that directly impact land stewardship and use decisions. Information on these characteristics is detailed in *Oak Ridge Reservation Physical Characteristics and Natural Resources* (Parr and Hughes 2006).

Following the acquisition of the land comprising the ORR in the early 1940s, much of the ORR served as a buffer for the three primary facilities: the X-10 nuclear research facility (now ORNL), the first uranium enrichment facility or Y-12 (now Y-12 National Security Complex), and a gaseous diffusion enrichment facility (now ETTP). Over the past 60 years, this relatively undisturbed area has evolved into a rich and

diverse eastern deciduous forest ecosystem of streams and reservoirs, hardwood forests, and extensive upland mixed forests. Satellite imagery shows the vivid contrast of the ORR in comparison to the land surrounding it (Fig. 3). Some physical characteristics and natural resource components are highlighted in Fig. 10. These include biologically significant areas, wetlands, caves, springs, and sinkholes.

The combination of a large land area with complex physical characteristics and diverse natural resources has provided a critical foundation for supporting DOE's environmental research mission, as well as the ability to build leading-edge facilities.

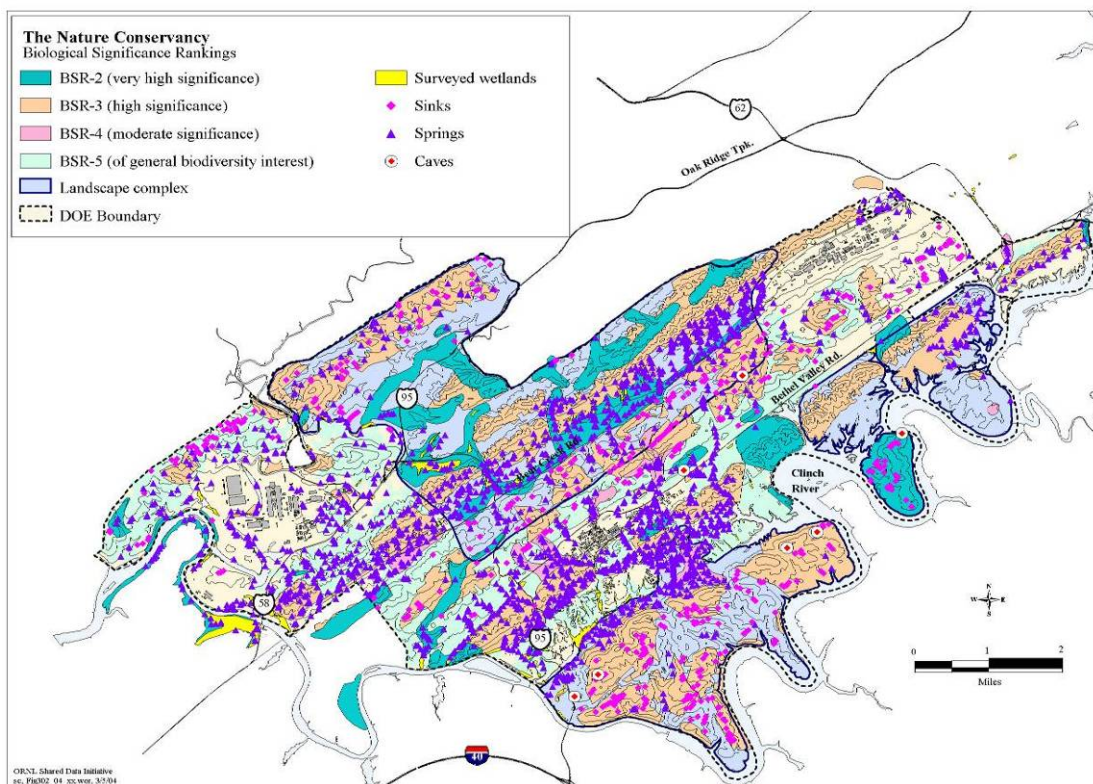


Fig. 10. ORR physical and natural resources.

5. Current Land and Facilities Use

The land on the ORR is used intensively for multiple purposes to meet the mission goals and objectives of DOE. Uses of the land area surrounding the developed sites include safety, security, and emergency planning zones; research and education; cleanup and remediation sites; environmental regulatory monitoring; wildlife management; biosolids land application; protection of cultural and historic resources; wildland fire prevention; land stewardship activities; reservation infrastructure; and public areas.

Figure 11 provides an overview of land uses on the ORR.

5.1 Emergency Response

The Oak Ridge emergency response areas (ERAs) map identifies the site responsible for providing first response, incident command and control, and where applicable, the emergency director role for events occurring on the ORR. The ERAs map (Fig. 12) is designed to ensure that emergency response roles and responsibilities are clearly defined and well understood by all involved organizations. For clarity, all land areas within the city of Oak Ridge are addressed.

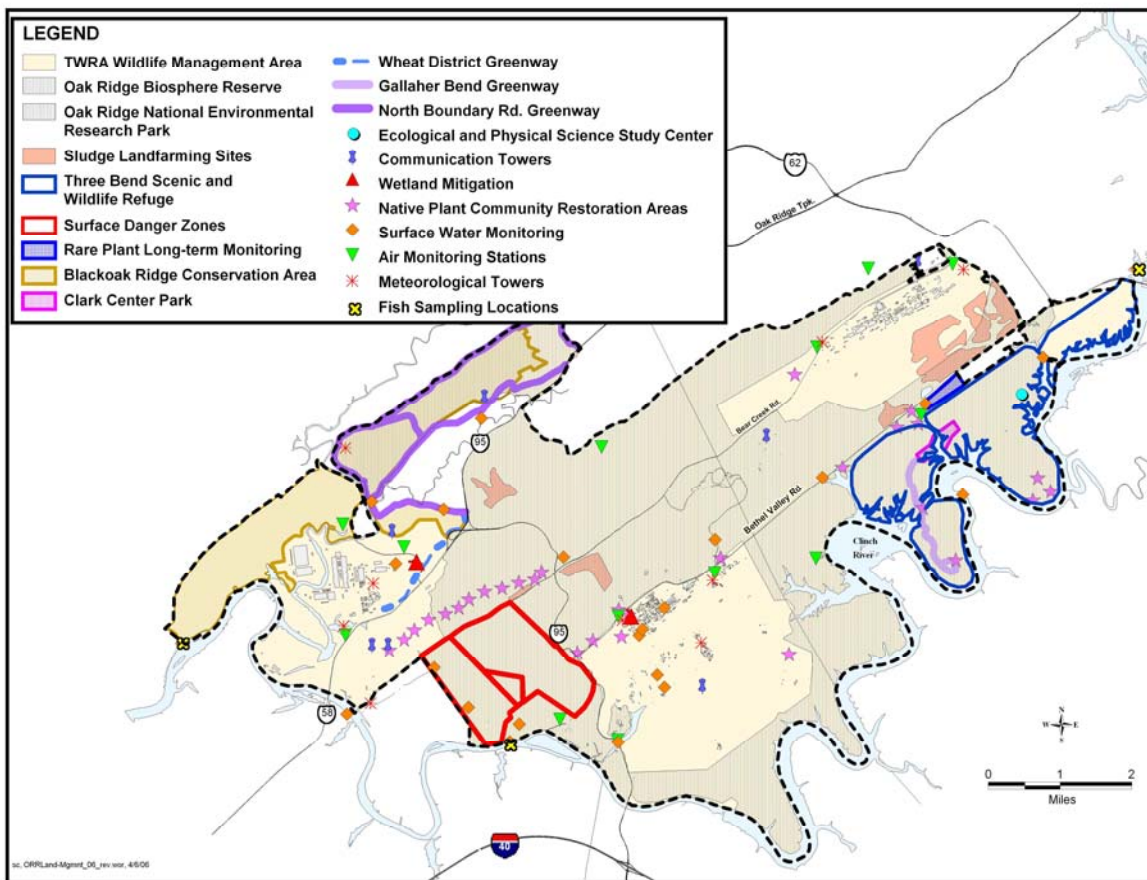


Fig. 11. ORR land management and operational uses.

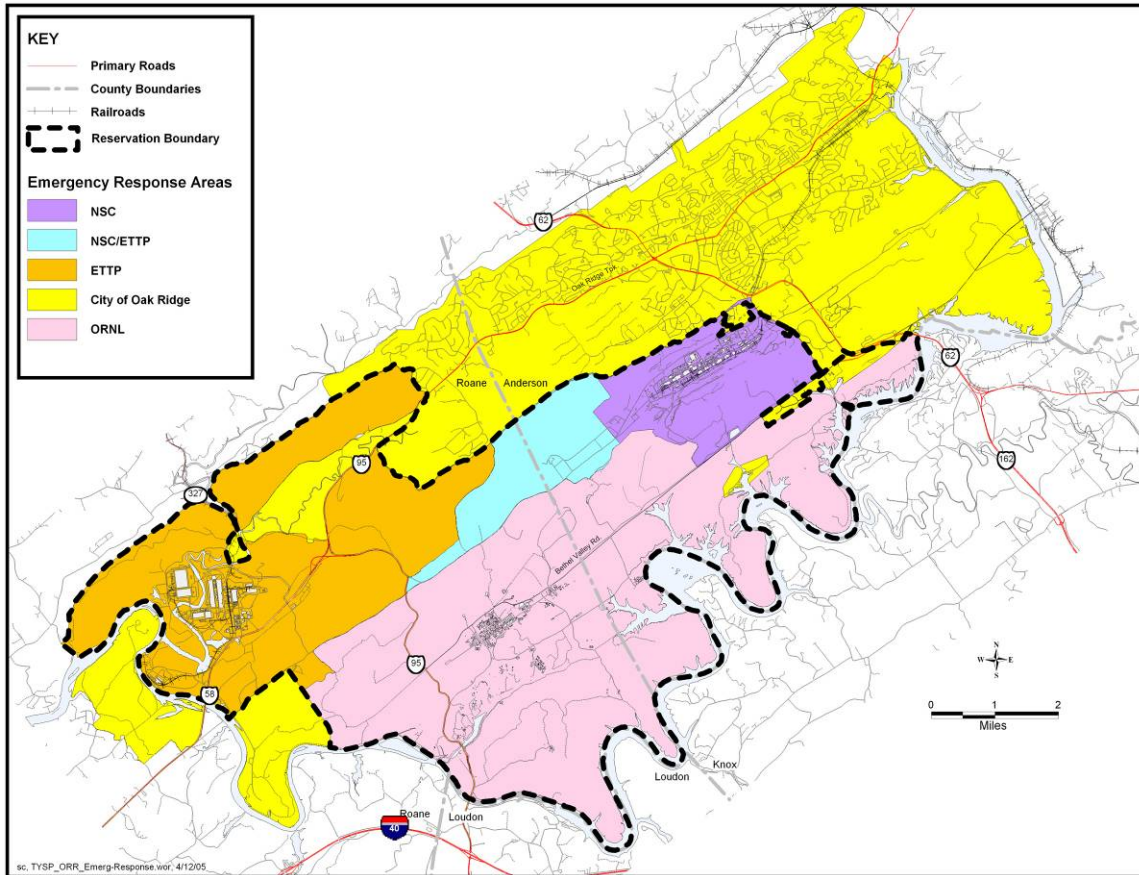


Fig. 12. ORR emergency response areas.

5.2 National Environmental Research Park

In 1980, DOE established the Oak Ridge National Environmental Research Park (Fig. 11). Consisting of approximately 20,000 acres, the research park serves as an outdoor laboratory to evaluate the environmental consequences of energy use and development as well as the strategies to mitigate these effects. The combination of protected, undeveloped areas with disturbed, developed, or developing areas within the research park allows the demonstration and assessment of various environmental and land use options.

Major DOE Office of Science research programs use the ORR land to meet mission objectives. In FY 2006 almost \$10 million was spent on DOE-supported environmental field-based research

directly dependent on the ORR land base. This expenditure is independent of construction of new facilities such as the SNS. The Office of Science considers the research and science value of the ORR to be critical and provides primary operations funding. The Oak Ridge research park is one of the few sites in the nation where large-scale ecological research, environmental technology, and measurement science are integrated with 50 years of environmental monitoring and research.

The availability of the protected lands and field research sites on the ORR allows DOE to support major field experiments that could not be conducted if the lands and associated ecological systems were not protected and secured for such long-term studies. This research addresses fundamental questions about the effects of energy-related activities on ecological systems and

compares such effects with the natural variation of ecological systems.

The National Environmental Research Park is a DOE National User Facility which has attracted more than 1200 users from ORNL as well as from 150 colleges, universities, industries, and other state and federal government agencies over the past 5 years. The 268 users during 2006 represented 49 organizations, including educational institutions, state and federal agencies, and others (Fig. 13).

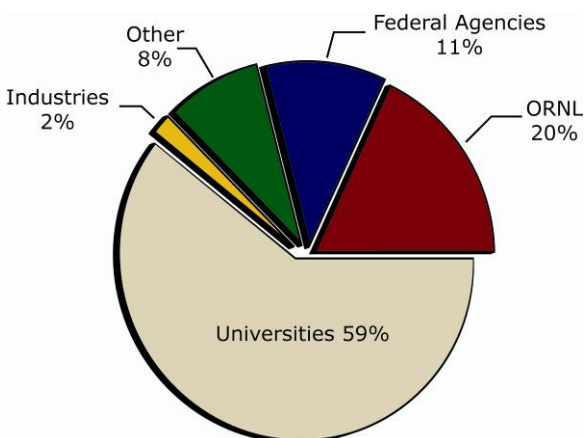


Fig. 13. Categories of Oak Ridge National Environmental Research Park users in 2006.

5.3 Field Research Areas

Environmental Research

Environmental field research on the ORR addresses major national issues and contributes to national and international collaborative initiatives on global climate change (temperature, carbon dioxide, precipitation), tropospheric air quality, remediation of contaminated land, sustainable development, biodiversity, and energy operations. These uses require protected blocks of land ranging from a few acres to more than 250 acres. Figure 14 shows the environmental research areas on the ORR.

Research use of the reservation can be categorized into four main types: carbon cycling and management research, ecosystem dynamics research, global climate change research, and remediation research and monitoring. Figure 15

shows the ORR areas with active, proposed, and planned research in each of these research categories. More information on environmental research on the ORR can be found at the ORNL Environmental Sciences web site (<http://www.esd.ornl.gov>).

In addition to DOE, past and present sponsors of research on the site include the National Science Foundation (NSF), the Department of Defense, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Agriculture, the Forest Service, the Nuclear Regulatory Commission, and the Electric Power Research Institute. Ongoing research collaborations also exist with the National Oceanic and Atmospheric Administration and the Tennessee Valley Authority (TVA).

More detailed information on uses of the ORR as an outdoor laboratory for research can be found in the *ORNL Ten-Year Site Plan* (ORNL 2007).

Energy Research

As part of DOE's emphasis on transmission system R&D, advanced overhead transmission composite conductors are subjected to various types of environmental stresses to simulate 20 to 30 years of field operation at the National Transmission Technology Research Center (NTTRC) Powerline Conductor Accelerated Testing Facility. This research site, operated by ORNL in partnership with TVA, is sponsored by DOE's Office of Electricity Delivery and Energy Reliability (OE) in partnership with industry.

DOE is also focusing on distributed energy systems and their integration into the electric grid. Over the past 2 years ORNL has developed the Distributed Energy Communications and Controls (DECC) testing facility for studying dynamic voltage and power-factor-control supplied from distributed energy resources. Because ORNL owns and operates its own electricity-distribution utility for the Laboratory campus, the distribution system can be configured to provide optimum opportunities for

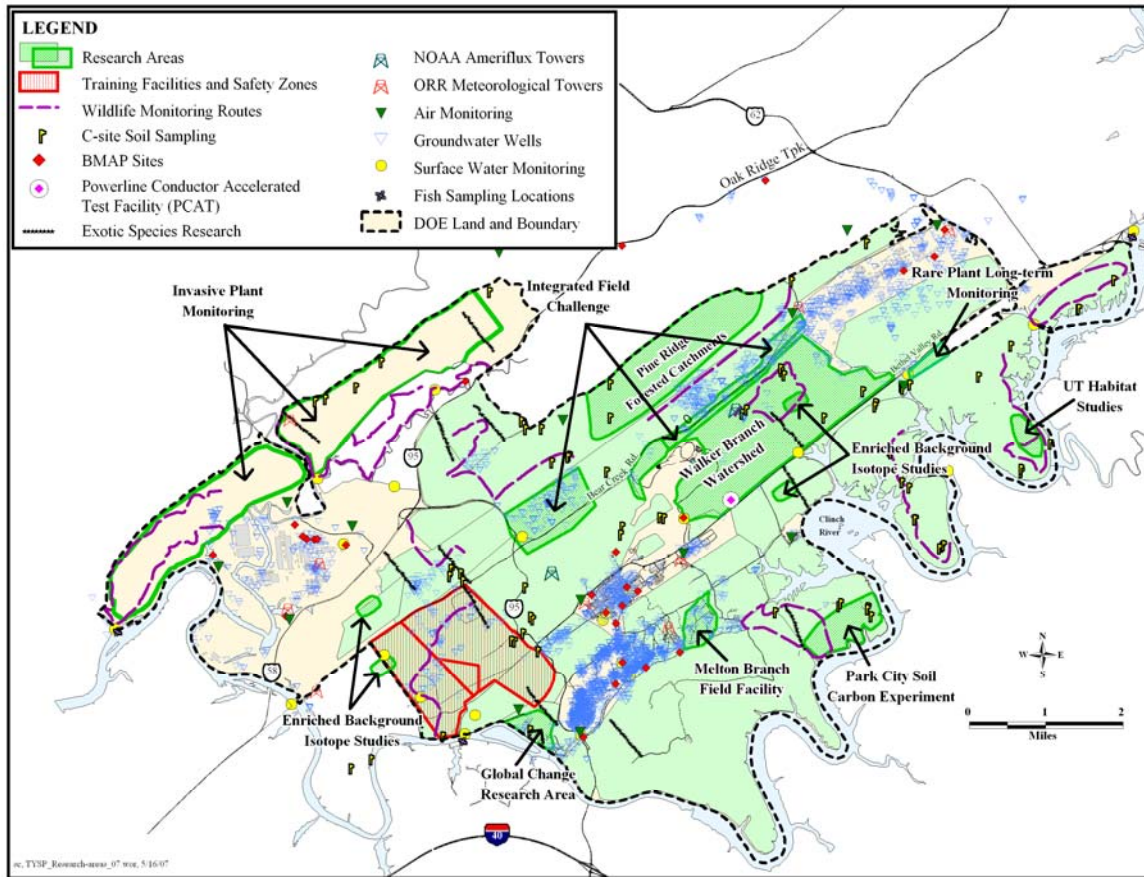


Fig. 14. Environmental research areas on the ORR.

testing of non-active power (including reactive power) injection effects from rotating and inverter-based distributed energy. The DECC laboratory is also unique in that the tests are designed by representatives from the electric-utility industry and distributed-energy manufacturers to address the actual challenges facing utilities and potential scenarios for the future.

SensorNet

The objective of the SensorNet project is to develop and/or discover the technology, standards, and technical requirements for an integrated national warning and alert system. The system is being designed to provide the Department of Homeland Security with an incident discovery, awareness, and response capability addressing local, regional, and national needs. The networking infrastructure will be a common data highway for the near-

real-time intelligent collection, processing, and dissemination of sensor data that will include chemical, biological, radiation, nuclear, and explosives sensors; meteorological instruments; and other sensors (e.g., video cameras and air quality, environmental, and disease tracking). A small area test bed has been established in the courtyard area between Buildings 5100 and 5200 on the ORNL site.

5.4 Contaminated Sites and Remediation

DOE facility operations dating from the Manhattan Project in 1942 have resulted in contamination of the environment. As a consequence, the EPA listed the entire ORR on the National Priorities List in 1989. The DOE Environmental Management Program (EM) is responsible for environmental restoration of contaminated sites

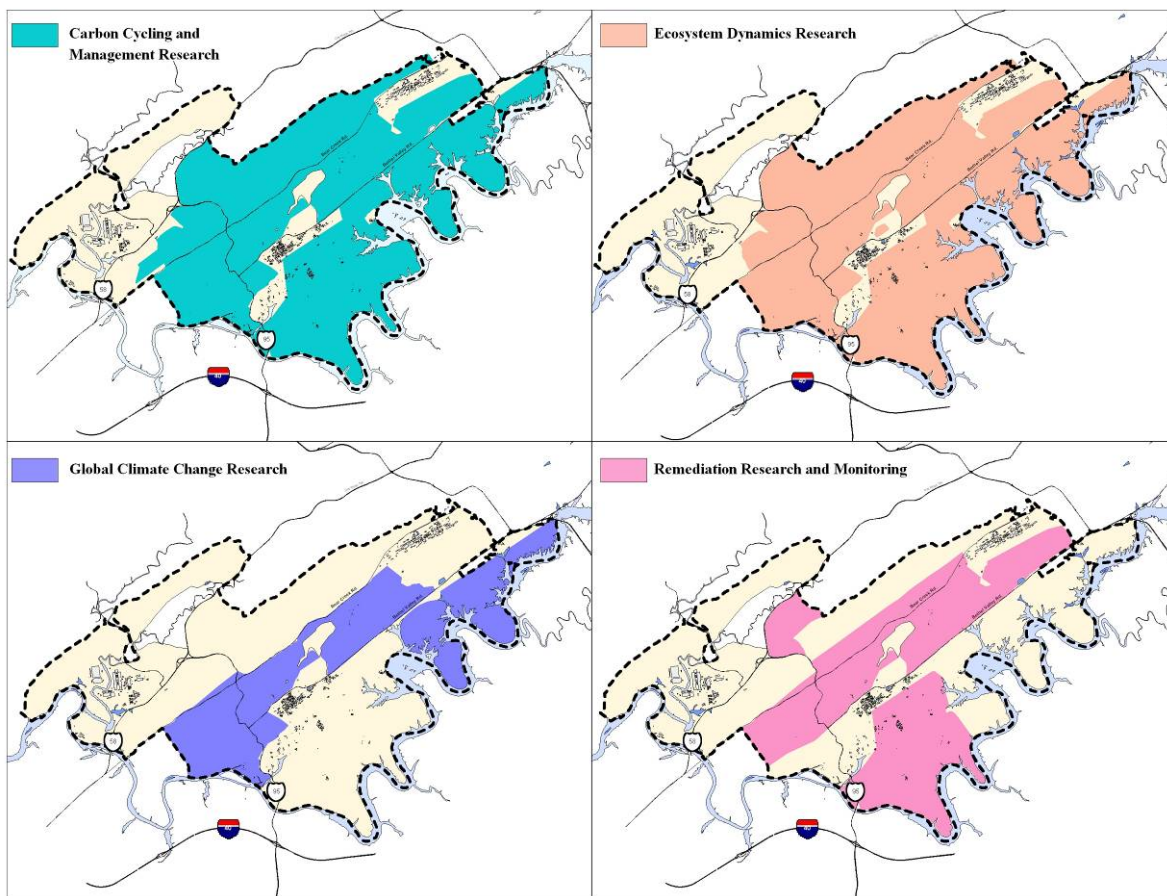


Fig. 15. Types of environmental research on the ORR.

within the ORR. In 2002, DOE adopted a plan to accelerate completion of the EM mission for the ORR, with remediation of the highest-risk sites by 2006 and completion of the overall EM scope by 2015.

In order to facilitate and streamline decision-making for remediation projects, the contaminated areas of the ORR have been divided into six areas roughly equivalent to the major hydrologic watersheds:

- East Tennessee Technology Park;
- Melton Valley portion, White Oak Creek at ORNL;
- Bethel Valley portion, White Oak Creek at ORNL;
- Upper East Fork Poplar Creek at the Y12 Complex;

- Bear Creek Valley at the Y-12 Complex; and
- Chestnut Ridge at the Y-12 Complex.

Remedial actions on the ORR are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and a Federal Facility Agreement approved by DOE, EPA, and the Tennessee Department of Environment and Conservation (TDEC) in 1992. Numerous remedial actions have been conducted for contaminated sites throughout the ORR. In recent years, remediation decisions have evolved from narrowly focused actions designed to address individual contaminated sites to watershed-scale decisions designed to better address the cumulative impacts of multiple contaminated sites within a watershed. This larger-scale decision-making

allows a decision on the end state to be made in concert with the decision on the series of remedial actions needed to protect human health and the environment for that end state. By considering the technical practicability and the cost of achieving a range of end states, decision makers can make informed, risk-based decisions consistent with the anticipated end use.

An End Use Working Group (part of the ORR Environmental Management Site-Specific Advisory Board) was formed in January 1997 to develop recommendations for end uses of contaminated areas on the ORR and to identify community values that could be used to guide DOE's remedial action decision-making process. The End Use Working Group was composed of individuals with a broad range of public interests and included participation by TDEC and EPA. The group considered the contaminants, the contaminant pathways, a range of end uses, and the cost and technical implications of achieving various end uses. In July 1998 the Working Group published its recommendations to DOE on end uses for contaminated lands and on community values.

Consistent with these recommendations, watershed Records of Decision (RODs) have been approved under CERCLA for Melton, Bethel, and Bear Creek Valleys; part of Upper East Fork Poplar Creek; and part of the ETTP and Upper East Fork Poplar Creek. In each case, the remedial actions have been designed to support the desired end use for that property. Additional CERCLA decision documents are planned for Chestnut Ridge and for additional actions in Bear Creek Valley. The watershed-level RODs issued to date are interim decisions, designed to address specific contaminant source areas and mitigate the potential for release of contaminants. Sitewide response actions for groundwater protection and long-term institutional controls have been deferred to future decisions. Some other aspects of watershed-scale decision-making have been deferred, pending the successful implementation and application of current source control measures. Among these deferred decisions is the determination of the effectiveness, both immediate and in the long term, of hydraulic isolation measures for long-lived

contaminants. Figure 16 shows the current state of the ORR physical and surface interface. It includes areas of concern with respect to groundwater plumes, soil contamination and buried waste, and capped, closed waste sites.

5.5 Compliance and Monitoring

Operations at all facilities on the ORR must comply with environmental requirements established by federal and state statutes and regulations, presidential executive orders, designated DOE orders, and legal compliance and settlement agreements. TDEC and EPA are principal among the regulatory agencies that issue permits, inspect operations, and oversee environmental compliance on the ORR. Changes in land use have the potential for impacting both operations and compliance activities at the Oak Ridge facilities. For instance, changes in the unpopulated land area could alter dose calculations required for meeting radiological requirements, such as those in the Clean Air Act's National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 *Code of Federal Regulations* 61, Subpart H).² Therefore, future land use expansion and building projects will work with environmental compliance organizations on the ORR to ensure that programs are in place to maintain the ORR's compliance.

In many states such as Tennessee, regulatory agencies are transitioning to watershed-based load-allocation permitting for wastewater discharges. The presence of additional new facilities on the ORR, which need to discharge wastewaters to ORR streams under the National Pollutant Discharge Elimination System, could result in reallocation of wastewater constituent load allowances among the various ORR entities discharging wastewater as a means of controlling watershed loading at an acceptable standard.

² Historical data has shown that the dose from radionuclides emitted to the atmosphere from operations at all facilities on the ORR have been below 10% of the 10 millirem NESHAP standard and less than 0.3% of the 300 millirem that the average individual receives from natural sources of radiation.

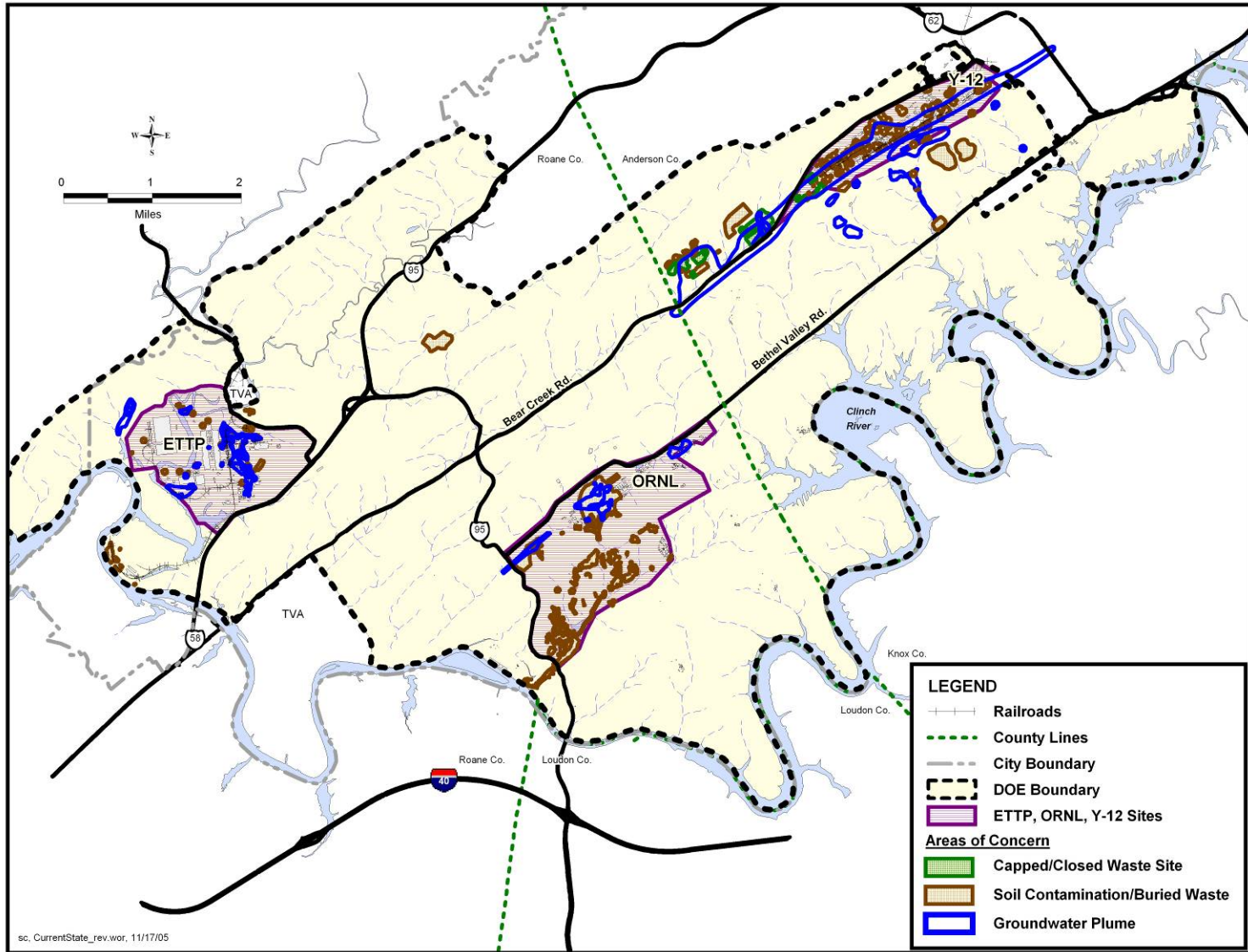


Fig. 16. Current interface of federal facilities and cleanup areas.

Extensive monitoring and surveillance programs which collect thousands of environmental samples and measurements are conducted annually on the reservation and in the surrounding areas. Monitoring activities include sampling of air, surface water, groundwater, soil, terrestrial vegetation, milk, fish, and wildlife. The results of these monitoring activities show that the major facilities on the ORR are consistently in compliance with environmental regulations and permit limits, and that the radiation dose to members for the public from all ORR pathways is well below the 100-millirem limit established by DOE.³ The *Oak Ridge Reservation Annual Site Environmental Report*, an annual report presenting the results of environmental programs on the reservation, can be accessed on the World Wide Web at http://www.ornl.gov/sci/env_rpt/.

Maps of monitoring locations at the three major facilities, on the ORR, and in the surrounding areas are also available in the annual site environmental report. Locations of some of the types of monitoring performed on the ORR are shown in Fig. 11.

5.6 Wildlife Management

Management of wildlife on an area as large as the ORR is necessary to ensure public safety and maximize wildlife health and diversity. The ORR was designated as the Oak Ridge Wildlife Management Area through an agreement between DOE and the Tennessee Wildlife Resources Agency (TWRA) that gives wildlife management responsibility to TWRA (Fig. 11). Management includes wildlife population control through hunting, trapping, and removal; wildlife damage control; restoration of wildlife species; preservation, management, and enhancement of wildlife habitats; coordination of wildlife studies; and law enforcement. A wildlife management plan integrating TWRA and DOE wildlife management goals for the ORR has been prepared (Giffen, Evans, and Parr

³ The 2003 dose to a hypothetical maximally exposed individual from all ORR pathways was calculated to be 8 millirem. An example of a maximally exposed individual is a hunter who consumes deer, geese, and turkey harvested on the ORR.

2007). Deer hunts have been held annually since 1984 (with the exception of 2001). Turkey hunting began in 1997. A second full-time, on-site TWRA officer was added in 2003.

The Three Bend Scenic and Wildlife Management Refuge Area consists of 2,920 acres that was set aside as a conservation and wildlife management area on June 23, 1999, in an agreement between DOE and TWRA, to be cooperatively managed for preservation purposes. The agreement establishes general guidelines for managing the area to preserve and enhance its natural attributes. Recent activities include conversion of fescue areas to restore native grasses (including prescribed burns), vegetative plantings to attract geese away from residential and facility areas, and public birding walks. Educational institutions use this area as an outdoor classroom for research ranging from bird habitat characterization to invasive plant impacts.

5.7 Conservation Easement

The Black Oak Ridge Conservation Easement was designated April 2005 through an agreement between DOE and the state of Tennessee. The agreement to protect 2,966 acres at the northwest part of the ORR is part of a settlement, not yet finalized, for natural resources damages associated with past DOE operations. TWRA will manage the land in accordance with a management plan developed jointly by the Tennessee Department of Environment and Conservation and TWRA with input from the public. The easement is shown in Fig. 11.

5.8 Land Application of Biosolids

The city of Oak Ridge has been applying sanitary sewage sludge to approved sites on the ORR since 1983 under agreements with DOE and the state of Tennessee; these sites are shown in Fig. 11. The city of Oak Ridge is presently renovating its wastewater treatment plant's sludge-drying system.

5.9 Cultural and Historic Resources

The general locations of cemeteries, churches, national historic landmarks, and old home structures are shown in Fig. 17. Six properties on the ORR are included in the National Register of Historic Places: New Bethel Baptist Church and Cemetery (the church and two grave houses), George Jones Memorial Baptist Church, and Freels Cabin (a dwelling and one outbuilding).

The DOE-ORO Cultural Resources Management Plan not only ensures DOE-ORO compliance with cultural resources statutes, but also ensures that cultural resources are addressed in the early planning stages of undertakings and that needed protection is provided or that the appropriate documentation is prepared before an undertaking is initiated (DOE 2001).

5.10 Wildland Fire Prevention and Response

Activities have been initiated to prevent wild-fires and to plan, prepare, and provide wildland fire control response on the ORR. The ORR Wildland Fire Management Plan addresses applicable requirements of the “2001 Federal Wildland Fire Management Policy and Implementing Actions” as adopted by DOE on February 24, 2003. A DOE-ORO Wildland Fire Implementation Plan was issued October 11, 2006. The plan serves as the fire program implementation planning tool and as a basis for use in the annual program planning and budgeting system. It provides for firefighter and public safety, consideration of values to be protected, and consistency with direction from the DOE-ORO land use planning and management process.

The hierarchy of management considerations for wildland fire on the ORR is prioritized as

1. the safety of firefighters, employees, and the public;
2. prevention of off-site release of radiological or other hazardous material;

3. protection of DOE structures, property, and programs;
4. protection of public and private property; and
5. protection of natural and cultural resources.

The primary goals of the ORR wildland fire management program are the following:

- to contain wildland fires to manageable areas through compartmentalization and rapid response of fire control resources;
- to control access to “official use only” areas of the ORR, implementing fire-safe practices for industrial or research operations conducted in the wildland areas of the ORR;
- to provide aggressive oversight of all open burn activities;
- to consider wildland fire issues in the land use planning and management process;
- to avoid damage to structures in DOE facilities and forest timber resources and prevent impacts to DOE programs from wildland fire events; and
- to prevent and reduce the impact of wildland fires through controlling wildland fuels in high access areas and controlling fire risks to the public.

From a fire preparedness standpoint, the ORR has been divided into 45 separate compartments to facilitate access by a mechanized wildland firefighting force. The compartment boundary roads are shown in Fig. 18. The size of the compartments were driven by a desire to limit environmental damage and keep DOE maximum resource losses to \$1 million or less, as directed by DOE Orders 450.1 and 420.1. Based on timber values alone, the compartments are limited to a nominal size of 1000 acres or less. Wildland fire compartment boundaries require a minimum road width of 20 feet with a vertical clearance of 13.5 feet. Approximately 30 miles (less than half) of existing secondary roads do not currently meet these criteria. Other areas of the compartment boundaries that back up to residential areas need to be upgraded to ensure adequate defensible space of a minimum of

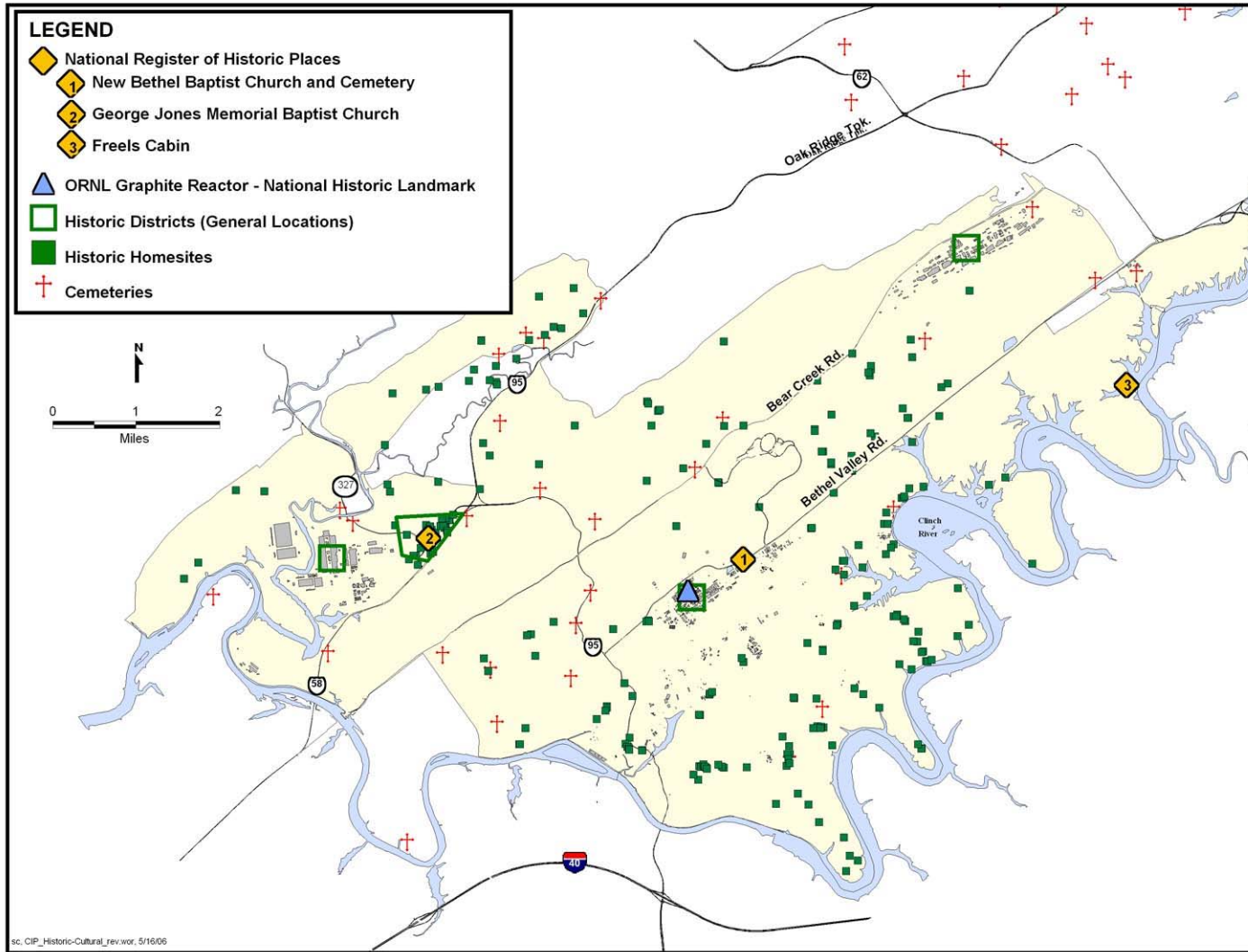


Fig. 17. Historic and cultural resources on the ORR.

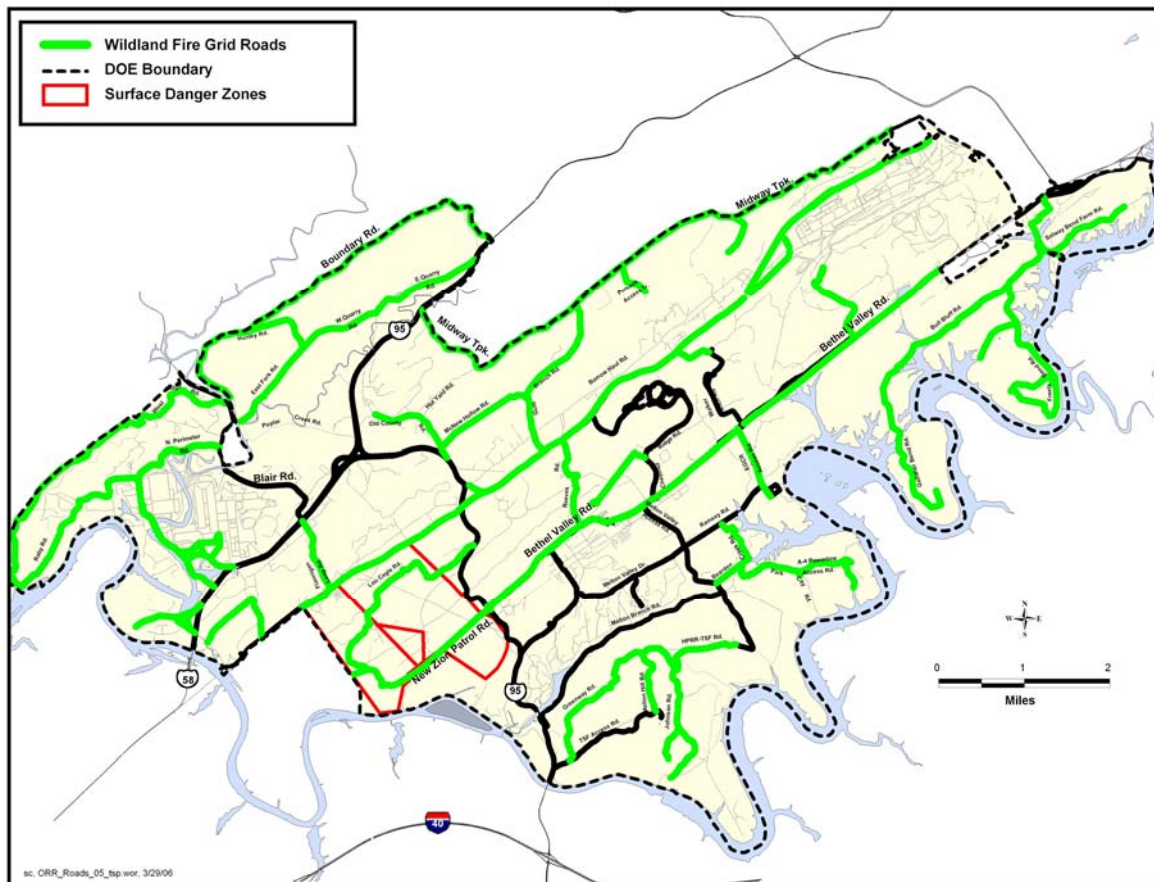


Fig. 18. ORR road infrastructure, including wildland fire road grid.

30 feet. Widening and upgrading the secondary access roads to meet these standards was initiated during FY 2004.

5.11 Ecosystem Management Activities

Activities that involve land resource protection, management, and special uses take place in environmentally sensitive areas, wetland mitigation sites, native grass restoration demonstration areas, and invasive plant treatment sites. These are shown in Fig. 11.

Invasive plant management planning was initiated in 2002 and included workshops; meetings with DOE, TWRA, and site contractors; and communication with other land management

agencies that already have begun to deal with invasive plants (e.g., the U.S. Forest Service, TVA, the National Park Service, the Department of Defense, the state of Tennessee). The ORR invasive plant management plan includes descriptions of priority areas, treatment timing, and approaches to management. An active, iterative management program is under way. Additional high-priority invasive plant sites are treated each year. The restoration of native grass on the ORR is one of the long-term goals of TWRA because of the many benefits to wildlife. The restoration is consistent with land management objectives of planting with native plants and includes the long-range benefit of reduced maintenance costs. A native grass management plan was prepared and published in 2007 (Ryon, Parr, and Cohen 2007).

Working with other land management agencies has allowed DOE to leverage resources. For example, in 2002 a partnership of ORNL, TVA, and TWRA targeted some transmission line right-of-ways for treatment, with supplemental replacement planting using native low-growing shrubs.

5.12 ORR Infrastructure

Major utilities that cross the ORR include gas, power, water, and communication lines. For many of these services, DOE contractors are dependent on the supplier not only for utility service to facilities within their developed areas, but also for support of more remote field sites.

Communications Towers

Communications towers have been erected in seven locations across the reservation through permission granted by DOE realty licenses. These locations are shown in Fig. 11.

Roads

Secondary reservation roads (Fig. 18) are used for multiples uses such as wildland fire control, utility maintenance, security, wildlife management, forest health activities, and access to facilities, research sites, monitoring locations, cemeteries, historic sites, and sensitive areas.

Utilities

Electric power is supplied to and metered separately for each of the three major installations on the ORR (ORNL/SNS, Y-12, and ETTP) through a single contract with TVA containing two delivery points, one at ORNL/SNS and the other at Y-12. The contract with TVA contains two rate schedules, the direct-serve industrial schedule for ORNL/SNS and the manufacture direct-serve schedule for Y-12. ETTP will continue to be served through Y-12 until late summer or fall 2007, when it is scheduled to be transferred to the city of Oak Ridge.

The TVA contract was signed on May 1, 2007, and covers a ten-year period. For the first time in

TVA history, the new contract was created as a one-contract, two-rate-schedule vehicle for supplying electrical power. The manufacture rate for Y-12 will result in an annual savings to the department of approximately \$2.7 million as a result of the reduced rate. This new contract also eliminates “provisional” billing. The previous TVA contract required a two-process mechanism for payment of the power bills. This system was created when ETTP was fully operational and, due to the cascade process used at the time, resulted in an average monthly bill for this one plant of \$20 to 25 million. The provisional bill allowed TVA to recoup 90% of the previous month’s bill for operational needs. The plants on the ORR no longer require this massive amount of electrical power for operations; therefore, this billing procedure was eliminated. This approach results in savings by eliminating the redundancy within the budget process. As a result of the increase in delivery points, DOE-ORO has incurred an additional \$1,500 delivery-point charge and a reduction in the conjunctive-billing savings. The savings from conjunctive billing for ORNL/SNS were diminishing because of the increased demand for power due to the increased computational abilities recently added to the ORNL computer system.

Natural gas delivery to ORNL, SNS, and Y-12 is accomplished through contracts with SEMPRA Energy Trading Corporation, Tennessee Gas Pipeline, and East Tennessee Natural Gas. SEMPRA Energy Trading Corporation, under contract through the Defense Energy Services Center of the Department of Defense, is the natural gas commodity supplier. Tennessee Gas Pipeline provides the pipeline capacity to bring natural gas to Tennessee from the Gulf of Mexico, and East Tennessee Gas Pipeline connects upstream and brings the gas to pumping stations B and C on the ORR. Station B supplies natural gas to ORNL, while station C supplies the gas to Y-12, allowing each site to be independent of the other from both a delivery and a management perspective.

Because DOE operations at ETTP have ceased except for the Environmental Management cleanup program and ETTP is undergoing rein-

dustrialization by private industry, the site is supplied separately from the rest of the ORR. Natural gas is delivered to ETTP through Station A, which is supplied and managed by the Oak Ridge Utility District. It is expected that the electrical system at ETTP will be transferred to the City of Oak Ridge Electrical Department, which will complete privatization of the ETTP utility system.

5.13 Public Areas

Clark Center Park and three public greenways are the only areas within the ORR that are open to the public without access control restrictions. DOE made improvements at Clark Center Park in 2005 to enhance access and enjoyment by individuals with mobility disabilities.

Gallaher Bend Greenway (within the Three Bend Scenic and Wildlife Refuge) was opened in December 1997. North Boundary Road Greenway, which follows East Ridge Road and

Poplar Creek Road, was opened in 1999 and expanded in 2005. Wheat Historic District Greenway was established in 2004. The greenways are shown in Fig. 11.

Other areas on the ORR are open to the public with prior arrangement through registration (e.g., tours sponsored by the American Museum of Science and Energy, public walks, and Ecological and Physical Sciences Study Center classes) or special permitting (TWRA hunts). The New Bethel Baptist Church and Interpretive Center is one of the few remaining original structures of pre-Manhattan Project days and is listed on the National Register of Historic Places. This facility and the adjacent cemetery are accessible to the public through special tours from the American Museum of Science and Energy. Public walks (e.g., bird walks, wildflower hikes, and trips to field research sites) are offered annually on the ORR.

6. DOE Vision and Mission for the ORR: The Basis for the Planning Process

6.1 ORR Vision

The ORR serves as an integrated science, education, industrial, and technological complex managed by DOE in partnership with the private sector—supporting a dynamic regional and national economy.

The ORR supports a variety of DOE missions, including scientific discovery and innovations, energy security, and environmental cleanup. Future uses of the ORR will include a mixture of activities that are compatible with and contribute to ongoing and anticipated DOE missions. According to current plans, the reservation will be used to support many of the same programs it currently supports while adapting to changing national goals and interests and to reduced federal budgets.

Planning assumptions include the following:

- DOE missions will be given priority in future uses of the ORR.
- Because it is impossible to know the nature of all future DOE activities, planning should preserve reasonable flexibility to allow the establishment of other DOE activities on the ORR. Where the nature of future DOE activities is known, appropriate sites should be reserved for those purposes.
- Among DOE activities included in future ORR land use plans are R&D, environmental restoration, and the treatment and long-term management of wastes generated on the ORR.
- Because of the risks associated with some DOE operations, it is appropriate to maintain buffer areas within the reservation and to coordinate an emergency planning and response capability with state and local governments.

- Areas identified by DOE as no longer needed for continued mission use are identified in the Facility Information Management System (FIMS).

A significant portion of the reservation will be maintained as federal land. A robust R&D mission is anticipated to continue for ORNL. ORNL includes a primary site, where most of the Laboratory's facilities are located. The Laboratory also coordinates use of the DOE Oak Ridge National Environmental Research Park, where outdoor environmental research is performed. An industrial capability will continue at the Y-12 National Security Complex to support the maintenance of the enduring nuclear weapons inventory. NNSA work will continue to be performed at the Y-12 National Security Complex.

Future use planning will primarily support ongoing and anticipated DOE missions. Portions of the reservation will be used to promote the development of private-sector enterprises in ways that are consistent with and complementary to DOE missions. Support also has been expressed for various forms of passive recreational use that are compatible with anticipated research, industrial, and conservation uses of the reservation.

DOE's reindustrialization initiative is highlighted at ETTP, where private industry is now taking title to land and facilities for non-government work. The reindustrialization and/or reuse of DOE facilities to directly or indirectly offset the cost of cleaning up contaminated facilities will have a dramatic effect on the reservation. In addition to saving DOE and the taxpayer millions of dollars in avoided demolition costs, the reuse of the facilities by the private sector has the added benefit of stimulating economic development in the East Tennessee region.

Public-private partnerships will be used to further the programmatic interests of DOE, including those associated with environmental clean-up. Select areas of land may be sold or made available for private industrial development if and when DOE determines that it is appropriate to do so.

6.2 ORR Mission Activities

The mission activities of the ORR are multi-functional and result in challenging complexities for land use planning. These activities include

- research (energy transmission studies, global climate change, ecosystem dynamics, carbon cycling, remediation research);
- reindustrialization;
- site cleanup and closure and waste storage;
- Defense Programs (NNSA) work;
- land and infrastructure management (natural and cultural resources, maintenance, utilities, roads, wildland fire prevention, long-term stewardship);
- recreation (public greenways, hunting, fishing, parks, community programs);
- education;

- private-party requirements (utilities, including cell and weather towers, roads, and railroads; sludge application; industrial building leases; long-term leasing for industrial purposes); and
- special agreements (conservation easements with state to offset natural resource damage liabilities; Three-Bend Scenic and Wildlife Refuge; TWRA ORR wildlife management area).

6.3 Land Use Designations on the ORR

The primary land use designations for sites on the ORR, shown in Fig. 19, are

- industrial,
- mixed industrial,
- research,
- institutional,
- recreational,
- wildlife refuge, and
- conservation.

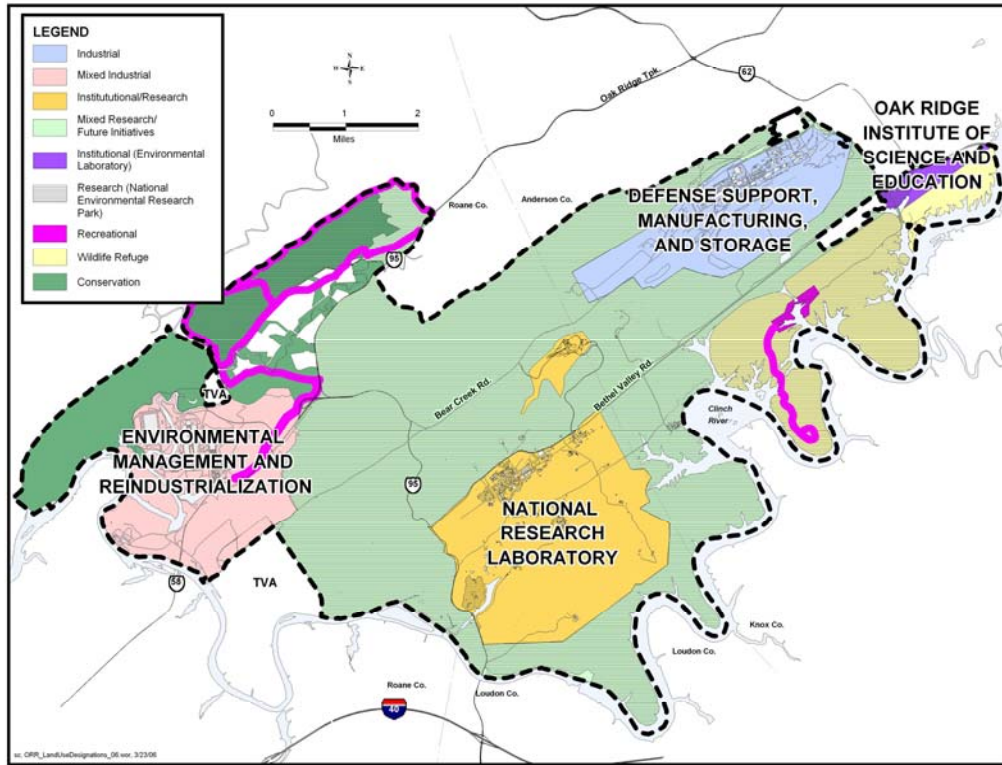


Fig. 19. Land use designations on the ORR.

7. The ORR Planning Process

Each contractor on the ORR has a process in place to identify, plan, and implement land and facility use changes on the basis of programmatic needs. Each contractor is responsible for ensuring project review for various compliance requirements, with final approval from DOE. This section describes the objectives, land use priorities, and review process for proposed changes in approved land use outside immediate plant site boundaries.

7.1 Planning Goals

The review process for proposed major ORR activities and land use changes includes consideration of these goals:

- Incorporate the ORR vision for land use (see Sect. 6.1, above).
- Require safe and environmentally responsible evaluation and operation.
- Enhance regional economic development.
- Cluster uses and activities to achieve synergistic benefits, except where programmatic requirements dictate a specific location.
- Give priority and due consideration to reuse of disturbed areas, preserving clean or undisturbed areas.
- Optimize future use options.
- Minimize pollution or provide innovative approaches to cleaning up existing disturbed areas.
- Ensure that ORR activities are compatible with adjacent land uses.

7.2 Land Use Priorities

Decisions about proposed activities or land use changes are made on a case-by-case basis to ensure compatibility with the following priorities:

- Priority 1: Preserve and protect land needed to meet the requirements of existing and

future DOE mission-related facilities and programs that require large, biologically and physically diverse protected land areas so that DOE can continue to meet its local, regional, and national mission obligations.

- Priority 2: Maintain land and facilities to promote sustainable economic development for the region through enhanced DOE missions, as well as through technology transfer and reindustrialization.
- Priority 3: Protect the environment, meet the requirements of scientific and technical education, and support educational research opportunities on the ORR.

7.3 Review Process and Participants

When proposed changes in land use are outside plant site boundaries, a comprehensive and integrated process is used to ensure proper planning, coordination, and communication among DOE and the various contractor representatives. These proposed changes in land use are evaluated by subject matter experts, program managers, and senior managers (if potential impacts are significant). Land use decisions are made by senior management on the basis of these evaluations. Individuals and groups involved in the ORR land and facility use decision-making process include

- ORR Manager (ORO Manager);
- senior ORO management;
- the DOE Reservation Management Coordinator;
- the ORO realty officer;
- the DOE ORR Management Team;
- the Contractor Interface Team;
- other DOE and contractor personnel; and
- public stakeholders, as appropriate.

The Oak Ridge Reservation Management Team

The Oak Ridge Reservation Management Team (ORRMT), composed of DOE subject matter experts and program and support staff, reviews land use activities and proposed changes in land use designations. The ORRMT was formed in 1995 to review all activities occurring on the ORR outside of the fenced site boundaries. Changes in land use are received via three primary means: from the program office, from the contractor, and from external sources. Most requests for changes in land use or activities come through the DOE Real Estate Office. All requests are reviewed by subject matter experts with input from program representatives and support staff (e.g., legal and finance). Recommendations or proposed actions are formulated and sent to DOE senior management for decisions on the appropriate disposition of the action or recommendation.

Reservation Management Coordinator

A Reservation Management Coordinator, appointed by DOE-ORO in September 2004, facilitates communication among reservation land users and ensures comprehensive, integrated land use planning. The Reservation Management Coordinator represents the Oak Ridge Manager on all issues affecting the ORR.

Contractor Interface Team

The Contractor Interface Team was established in May 2003 to provide integrated corporate oversight and decision making for activities affecting multiple sites and contractors on the ORR.

Community Attitudes and Stakeholder Involvement

DOE recognizes a wide complement of interested stakeholders in the Oak Ridge community who evidence varying degrees of interest related to the actions affecting DOE land use. The involvement of those stakeholders in many DOE actions has been, and will continue to be, critical to the success of DOE. At the same time, it is understood that DOE reserves to itself certain aspects of land use planning and decision-making, such as those related to mission requirements and Secretarial initiatives. DOE provides the opportunity for organizations and groups in the greater Oak Ridge community to participate in such discussions through an open process of public meetings and opportunities to comment on draft documents as appropriate.

8. Reservation Management Operating Budget

Reservation management activities are funded through various sources, one of which is the Contractor Interface Team. The Natural Resource Management task includes six subtasks that are funded through contractor overhead (Table 1).

The reservation management program at ORO is reviewed annually by ORO senior managers prior to allocation of each FY budget by the Planning and Budget Division. Funding for each program is provided to the overseeing organization. The Information Resources Management Division oversees facility (building) management; grounds (landscaping);

roads; utility right-of-ways; heavy equipment inventory, use, and maintenance; Joint Information Center infrastructure; records management; and the wide-area radio system.

To improve integrated management of the entire ORR, a joint DOE-Contractor Interface Team was initiated to review overall management of the ORR and work on crosscutting issues. One significant outcome of this review was a better understanding of all reservation activities and their funding sources. Several activities were determined to not be site-specific and were included in the ORO reservation management budget rather than in the site budgets.

Table 1. 2008–2018 ORR management operating budget (excluding ORR management activities) in thousands

Description	FY 2007 Approved	FY 2008 Proposed	FY 2009 Proposed	FY 2010 Proposed	FY 2011 Proposed	FY 2012 Proposed
<i>Natural Resources Management</i>						
Management, Coordination, Communication	177	173	181	187	193	199
Field Access and Surveillance	100	104	107	112	115	118
Wildlife Management	716	710	730	807	831	856
Integrated Ecosystems Management	395	393	409	425	438	451
Land Use Planning	238	249	260	272	280	288
Forest Stewardship	0	141	147	154	159	164
Description	FY 2013 Proposed	FY 2014 Proposed	FY 2015 Proposed	FY 2016 Proposed	FY 2017 Proposed	FY 2018 Proposed
<i>Natural Resources Management</i>						
Management, Coordination, Communication	205	211	217	224	231	238
Field Access and Surveillance	122	126	130	134	138	142
Wildlife Management	882	908	935	963	992	1,022
Integrated Ecosystems Management	465	479	493	508	523	539
Land Use Planning	169	174	179	184	190	196
Forest Stewardship	297	306	315	324	334	344

9. ORR Future Land and Facility Use Planning

Future uses of the ORR will, in most cases, expand and build on current land uses, not replace them. Future uses include field research areas and facilities (environmental research, security and monitoring systems); environmental management and long-term stewardship areas (remediated, restored, and protected contaminated areas); infrastructure improvements (communications, utilities); land responsibility actions (emergency response, wildland fire prevention and response, conservation easements); integrated management of natural resources; and additional public and educational opportunities (greenways, stakeholder involvement). Current land and facility uses are expected to continue.

9.1 Field Research Areas and Facilities

The ORR offers unparalleled resources for ecosystem-level and large-scale research within a 20,000-acre outdoor laboratory. Along with large blocks of forest and diverse vegetational communities, the Oak Ridge National Environmental Research Park offers the ability to use or establish highly equipped sites in a secure area. Existing roads and the utility infrastructure provide critical field research components. National recognition of the ORR as a resource has led to proposed uses that are components of both continental- and regional-scale projects.

Future environmental research is proposed and/or planned across the entire reservation (except for the ETTP area) in addition to areas where research is already in progress. The focus of future experimental research and monitoring activities is identified in greater detail in the 2007 *ORNL Ten-Year Site Plan* (ORNL 2007). Future field research areas and facilities are

- aquatic-terrestrial interface studies,
- detection and simulation of ecosystem response,
- an Ecological Field Station,

- NTTRC facilities
- National Ecological Observatory Network (NEON),
- old-field succession free air CO₂ enrichment experiment, and
- SensorNet nodes.

Figure 20 shows areas of planned new future research on the ORR.

Aquatic-Terrestrial Interface Studies

A number of small, essentially undisturbed watersheds that have high potential as environmental research sites are located along the southern boundary of the ORR.

Walker Branch Watershed (WBW) is the best-known and most intensively studied watershed on the reservation (see <http://walkerbranch.ornl.gov/>), but it is not the only area worth attention. Bearden Creek and McCoy Branch on the west and east sides of WBW contain second- and third-order perennial streams. The embayments of Melton Hill Reservoir at the mouths of all three of these watersheds are relatively isolated and have good potential for aquatic research. There are also a number of other first- and second-order watersheds along the south shore of the reservation that could be used for replication studies; three of these are downstream of White Oak Creek, and four are between Melton Hill Dam and WBW.

The aquatic research that could be done at these sites includes development and testing of new environmental tracers to measure ecological processes. The Pine Ridge Forested Catchments are four adjacent, relatively undisturbed first-order forested catchments that offer a large potential for watershed and stream research in a different major type of geological setting. Current efforts are focused on the refinement of the science plan and funding actions.

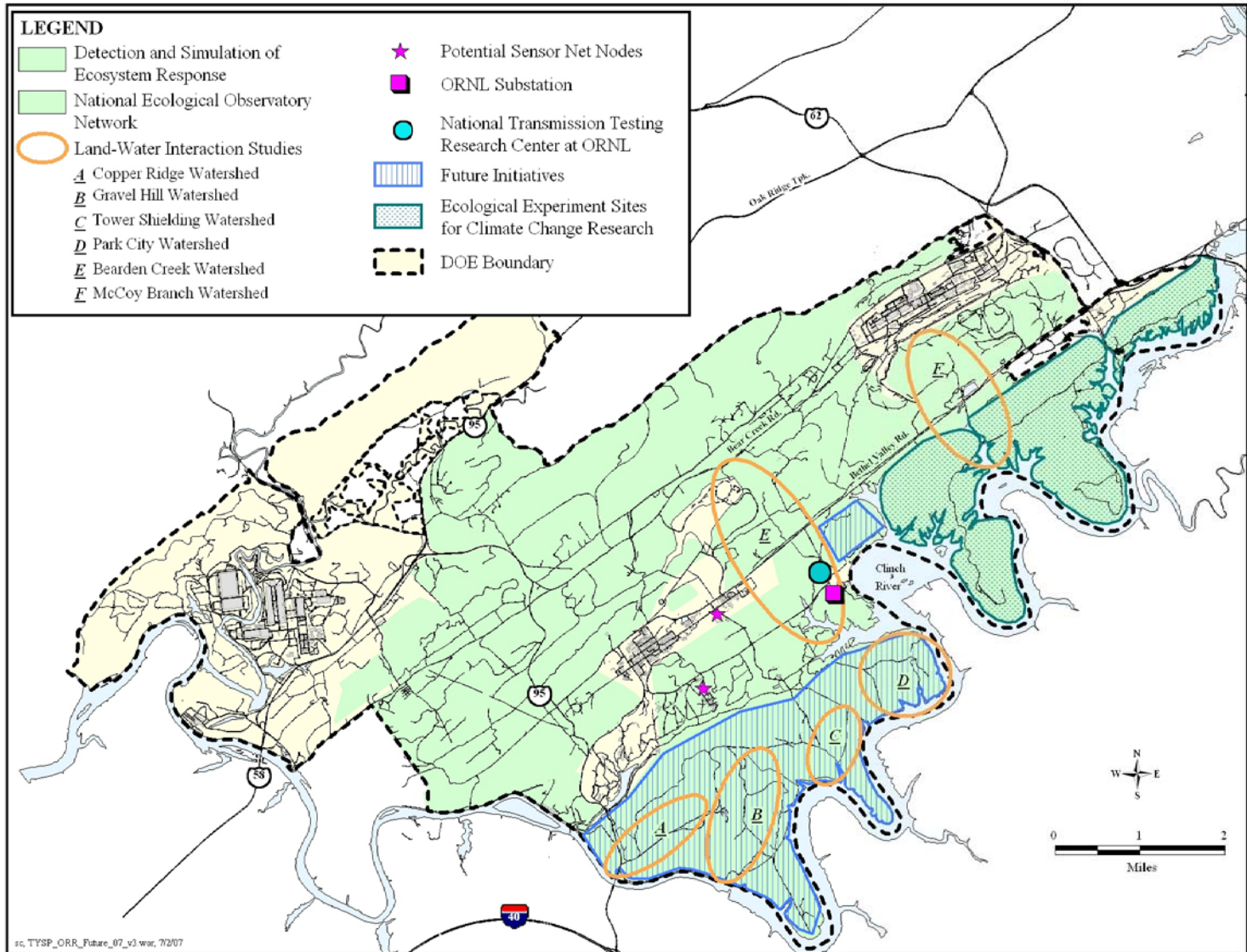


Fig. 20. Future new land uses and facilities on the ORR.

Detection and Simulation of Ecosystem Response

The ORR will be an important component of the Detection and Simulation of Ecosystem Response initiative, which is also part of the ORNL agenda. Specific locations, from the Cumberland Plateau through the ORR and up to the Great Smoky Mountains, will be used for developing new methods to detect changes in ecosystems at the physiological and genomic levels brought on by natural and human events. This capability, linked to new ecosystem models, may provide insights into ways to detect potential changes early enough so that mitigation plans can be implemented before permanent, irreversible, system-level changes occur.

Ecological Field Station

The University of Tennessee at Knoxville (UTK) is interested in locating an ecological field station in the vicinity of the ORR. The field station would address DOE missions in both research and education. UTK is currently collaborating with ORNL on DOE research in terrestrial ecology. Future field-based efforts are being planned in response to DOE mission research.

This facility would facilitate field research in both terrestrial and aquatic ecosystems on the ORR by local scientists, students, and visiting researchers from around the world. The facility would include classrooms, offices, laboratories, and perhaps even modest bunk and kitchen capabilities for visiting researchers.

The field station needs to be located in a protected and secure area, yet be accessible to students and guests. Proximity to the UTK campus and to field research on the ORR is another important factor. Analyses of site needs and availability are under way.

National Ecological Observatory Network

ORNL and university partners were selected by the NSF NEON to establish infrastructure for intensive monitoring of a wildland site. Such sites will be studied and made available to

researchers for up to 30 years. Current plans are to include some portion of the ORR (perhaps Walker Branch Watershed) as the wildland site. In addition, manipulative experiments (primarily temperature) may be implemented, and the ORR is being considered as a possible node in that network as well.

National Transmission Technology Research Center Facilities (Power Delivery Research Center)

The testing capabilities of the NTTRC (Power Delivery Research Center) will be expanded to include at-voltage testing of overhead conductors, indoor testing of advanced conductors to provide a more controlled environment, and testing of superconducting cables and power electronics. Development of advanced transmission testing in Oak Ridge is a recommendation of DOE's National Grid Study. Steady load demand growth, new and increased power flow patterns, new line siting difficulties with long lead times, and a drop in transmission network investment over the past 20 years have led to a critical R&D need. The need for an emphasis on transmission and sensor R&D is recognized by DOE, which is working with manufacturers (such as American Superconductor and Southwire) and utilities (such as TVA and American Electric Power) on proposals that would significantly expand the role of the NTTRC (Power Delivery Research Center) at ORNL.

These proposed projects include the following:

- Powerline Conductor Operational Test Facility,
- Secure Power Network,
- Transmission Power Electronics Test Facility, and
- Very Low Impedance Cable Project.

SensorNet

The objective of the SensorNet project is to develop an interoperable system that allows real-time analysis for sensor information. The system is being designed to provide the Department of Homeland Security with an incident-discovery,

awareness, and response capability addressing local, regional, and national needs. The networking infrastructure will be a common data highway for the near-real-time intelligent collection, processing, and dissemination of sensor data that will include chemical, biological, radiation, nuclear, and explosives sensors; meteorological instruments; and other sensors (e.g., video cameras and air-quality, environmental, and disease tracking).

SensorNet is transitioning a number of the test beds to operational prototypes sponsored under separate funding, including Southeast Transportation Corridor Pilot, a Domestic Nuclear Detection Office-led effort to place a radiation sensor system in nine states; the Southeast Region Radiation Pilot Program, sponsored by Open Geospatial Consortium, to deploy a sensor suite at the Port of Charleston; and the establishment of a Sensor Fusion Center for the state of Kentucky and the city of Memphis. The ORNL test bed will continue to be developed, and in 2007 IBM and Oracle have agreed to support the test-bed activities (as they relate to development of an open-source implementation of INFO-d).

Old-Field Succession Free Air CO₂ Enrichment (FACE) Experiment

A proposal is being developed for the DOE Office of Science to plan and initiate a new global change experiment. Forest regeneration and development contribute to the global carbon cycle, but an understanding of how the rates and patterns of woody tree establishment and growth under future atmospheric and climatic conditions will alter predictions of carbon cycling in natural ecosystems is still lacking. This shortcoming can be addressed by focusing on an intact, successional, old-field ecosystem. Because successional trajectories are well understood in these systems, and the process of succession occurs rapidly, the experiment can be conducted within a realistic time frame.

ORNL has been conducting a multifactor manipulation (CO₂, temperature, and soil moisture) of a constructed old-field ecosystem using 4-m-diameter open-top chambers in the 0800 area of

the ORR. This approach has limited the ability to sample destructively, and constrained the understanding of key ecological interactions, such as above- and below-ground herbivory. Hence, concepts are being developed to establish a FACE experiment that also includes precipitation manipulation (imposed drought) in an intact old-field system. A key component of the proposed experiment is the evaluation of simulated atmospheric and climatic change on woody plant establishment under realistic ecological field conditions.

The experiment will provide key data, such as the effects of elevated CO₂ on old-field productivity, soil carbon cycling, tree seed germination, and seedling mortality, and the modifying influence of drought for ecosystem and dynamic vegetation models that are used to address carbon and climate feedbacks.

The proposed experiment will require a protected and secure area, yet one that is accessible to local and visiting researchers. Sufficient acreage will be needed to establish long-term manipulative experiments; and proximity to infrastructure (roads, electricity, water, and internet) is essential. The research requires access to sites with ecological characteristics such as replicated habitats; distinct aquatic, old-field, and forest interfaces; successional gradients; and microclimate gradients.

Analyses of possible locations on the ORR are currently under way. Preliminary screenings suggest that Three Bend area offers unique characteristics for this research and that the proposed research is consistent with the current missions of the Three Bend area.

9.2 Environmental Collaboration Areas

Environmental Collaboration Areas are sites of special environmental significance or sites with great potential for restoration and/or mitigation where state, federal, and educational agencies are working together, or can work together in the future, to solve environmental problems. Types of areas with additional opportunities for col-

laboration shown on Fig. 20 are sites that could receive treatment to remove invasive plants, restoration of native plant communities, and potential pre-impact wetland mitigation.

9.3 Future Initiatives

Land for future initiatives may not have specific projects associated with it. Diverse physical characteristics and the evaluation of proposed sites for past projects are factors used to identify the suitability of land areas for future initiatives. Some of the general land areas identified for future needs are shown in Fig. 20.

In 2006, DOE leased approximately 12 acres of underutilized land at ORNL to CROET for the development of the Oak Ridge Science and Technology Park. The property that was leased is located in the central portion of the ORNL campus near Bethel Valley Road and 1st Street. The purpose of the Science and Technology Park will be to advance the programmatic mission of the Office of Science and the Laboratory through the enhancement of its technology-transfer mission. Specifically, DOE will further its mission by making space available to private-sector companies that are collaborating with scientists and supporting research projects at ORNL and companies that are commercializing DOE-based technologies for use by the private sector. Construction of the first facility at the Science and Technology Park is scheduled to begin in 2007.

9.4 Environmental Management and Long-Term Stewardship

ORR Risk-Based End State Vision, Rev. 2 (DOE 2004), describes the long-term vision for the ORR in support of DOE Policy 455.1, Use of Risk-Based End States, and the associated guidance document. The risk-based end state represents site conditions that reflect the planned future use of the property at the completion of the EM mission and is appropriately protective of human health and the environment consistent with that land use. The intent of this policy is to

ensure that cleanup efforts throughout the DOE complex are driven by clearly defined, risk-based end states and to identify any potential variances between current cleanup plans and action required to attain the risk-based end state.

Each of the major facilities on the ORR has a different expected end use. ETTP has no continuing DOE mission and will be remediated to allow use of the site as a commercial industrial park without a significant DOE presence. ORNL will continue to be operated by the DOE Office of Science as a multidisciplinary R&D center (ORNL 2002b). The Y-12 National Security Complex will continue to be operated by NNSA for national defense operations (BWXT 2003).

The current life-cycle baseline supports the end uses contained in the RODs where available and consistent with recommendations of the End Use Working Group for those areas for which decisions have not been made. The end uses assumed in the life-cycle baseline plan for the ORR areas are as follows:

- ETTP: Unrestricted industrial use (commercial industrial park);
- Melton Valley: Some restricted waste management areas; some DOE-controlled industrial use;
- Bethel Valley: Some DOE-controlled industrial use; some unrestricted industrial use;
- Upper East Fork Poplar Creek: DOE/NNSA-controlled industrial use;
- Bear Creek Valley: DOE/NNSA-controlled industrial use (with some restricted waste management areas); and
- Chestnut Ridge: DOE/NNSA-controlled industrial use (with some restricted waste management areas).

Following completion of the EM mission in 2015, the primary hazards remaining within the ORR are expected to consist primarily of the areas dedicated to long-term management of radioactive and hazardous waste. These include capped waste disposal sites in Melton Valley, the Environmental Management Waste Management Facility and the Bear Creek Burial Ground

in Bear Creek Valley, and capped waste disposal sites on Chestnut Ridge and other locations. Additional hazards may include contaminated sediments in White Oak Creek and White Oak Lake in Melton Valley and miscellaneous smaller hazard areas. Potential risks from each of these hazards will be managed primarily through the use of institutional controls to restrict access to these areas and ongoing monitoring. Figure 21 shows the ORR physical and surface interface for the risk-based end state plan.

9.5 Enhancement of Area Economic Development

Since its inception in 1996, the Reindustrialization Program has been responsible for leasing over 80 properties and bringing more than 35 private companies to ETTP. Reindustrialization is an innovative method to accelerate cleanup of DOE facilities at a reduced cost. It allows for productive use of idle DOE facilities, offsets the negative effects of DOE downsizing, and helps to stimulate the regional economy.

A primary focus of the Reindustrialization Program today is to establish a Brownfield industrial park at ETTP (which is referred to as the Heritage Center). Until now the focus has been on leasing property to CROET, which then subleases the property to private industries. In keeping with DOE's plans to accelerate cleanup of ETTP, the focus of the Reindustrialization Program has shifted from leasing to transfer of certain properties at ETTP. Property transfer is a key component to accelerating the cleanup of ETTP and establishing the private industrial park. Transfer of facilities will result in a

significant savings to DOE because the new property owner will be responsible for building demolition.

The reindustrialization of ETTP is part of an overall development plan for the west end of Oak Ridge. Horizon Center, a 1000-acre industrial park located to the east, is targeted for "high-end industries" that would prefer to locate on a Greenfield site (i.e., property that has never been used by DOE) rather than a Brownfield. Approximately 500 acres of the site have been transferred to CROET for development purposes. To date, two facilities have been constructed, and discussions are under way for the construction of two additional buildings.

The types of industries targeted for Horizon Center include research and development companies, pharmaceutical companies, and computer and electronic manufacturers. In addition to the development at the Heritage and Horizon Centers, DOE is considering the transfer of property in this vicinity for light industrial and/or commercial use. With the transfer of land for this purpose, CROET will have the full complement of properties that can meet the demands of all types of businesses. The city of Oak Ridge is involved in the overall development plans for the west end of Oak Ridge and is working in concert with DOE and CROET on the transition of infrastructure at ETTP, as well as development of the new infrastructure to meet the demands of the Heritage and Horizon Centers, as well as other projects in the area such as Reality Ridge, a residential/commercial area located across the Clinch River from ETTP.

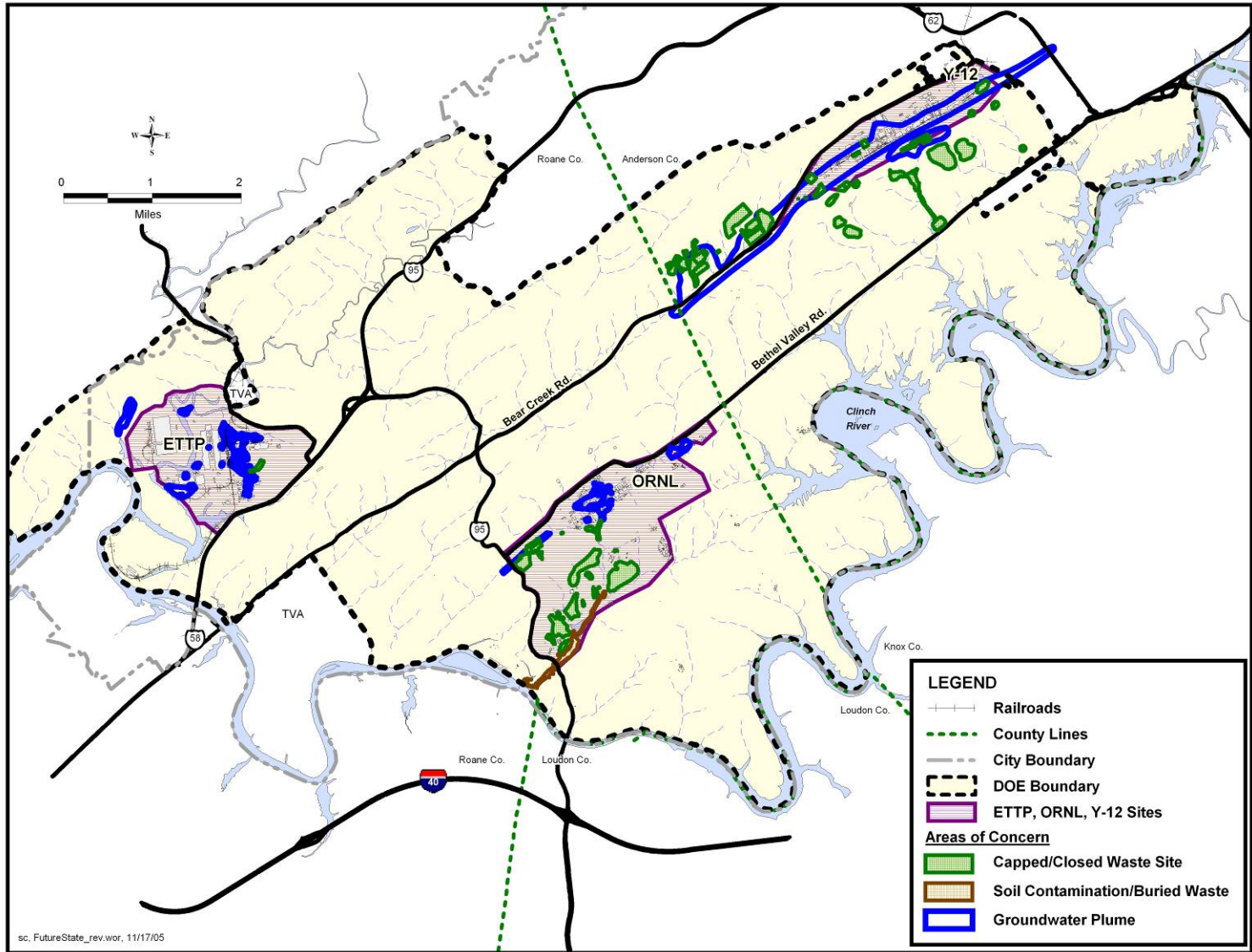


Fig. 21. ORR physical and surface interface for risk-based end state plan.

10. Summary of Planned Actions

10.1 Near-Term Actions

Actions initiated during FY 2007 and/or planned for FY 2008 are as follows:

- Establish communication tower on Chestnut Ridge.
- Continue upgrade of secondary roads for wildland fire management.
- Increase capacity of X-10 substation.
- Expand locations of SensorNet nodes.
- Transfer DOE facilities to American Museum of Science and Energy Foundation (American Museum of Science and Energy and incidental properties).
- Transfer ED-6 parcel to city of Oak Ridge (335 acres).
- Continue implementation of wildland fire control and prevention.
- Split TVA contract to transfer ETTP to city of Oak Ridge.
- Initiate construction of the first Oak Ridge Science and Technology Park facility.

10.2 Five-Year Actions

Actions planned within the next 5 years include the following:

- Develop detection and simulation of ecosystem response research.
- Establish Land-Water Interaction Studies.
- Implement NEON.
- Initiate old-field succession free air carbon dioxide enrichment experiment.

10.3 Long-Term Actions

Actions in the planning for future include the following:

- Implement long-term stewardship of contaminated areas.

References

- BWXT (BWXT Y-12 LLC). 2003. *Y-12 National Security Complex Ten-Year Comprehensive Site Plan, FY 2004–FY 2013*. Y/MOD-012, Rev. 3. BWXT Y-12, Oak Ridge, Tenn. August.
- CBER (Center for Business and Economic Research, University of Tennessee). 2007. *The Economic Benefits of the US Department of Energy for the State of Tennessee, 2006*. Prepared by CBER for the U.S. Department of Energy, Oak Ridge Office, Oak Ridge, Tenn. May.
- CIP (Comprehensive Integrated Planning). 1998. *Comprehensive Integrated Planning: A Process for the Oak Ridge Reservation*. ORNL/M-6545. Prepared by Lockheed Martin Energy Research Corporation, LLC, and Lockheed Martin Energy Systems, Inc., for the U.S. Department of Energy, Oak Ridge, Tenn. Available online at <http://www.ornl.gov/~dmsi/cip/1998/cip.htm>.
- CIP. 1999. *Comprehensive Integrated Planning Process for the Oak Ridge Operations Sites*. ORNL/M-6717. Prepared by Bechtel Jacobs, LLC; Lockheed Martin Energy Research Corporation, LLC; and Lockheed Martin Energy Systems, Inc., for the U.S. Department of Energy, Oak Ridge, Tenn. Available online at <http://www.ornl.gov/~dmsi/cip/cip.htm>.
- DOE Order 430.1, Life Cycle Asset Management (LCAM).
- DOE Order 430.1B, Real Property Asset Management (RPAM).
- DOE (U.S. Department of Energy). 2003. *ORR Land Use Stakeholder Review*. Predecisional Draft. DOE Oak Ridge Office, Oak Ridge, Tenn. October.
- DOE 2006. *Department of Energy Laboratory Plans, FY 2007–FY 2011*. U.S. Department of Energy, Washington, D.C.
- Giffen, N.R., J.W. Evans, and P.D. Parr. 2007. *Wildlife Management Plan for the Oak Ridge Reservation*. ORNL/TM-2006/155. Oak Ridge National Laboratory, Oak Ridge, Tenn. June.
- Oak Ridge Land Use Planning Focus Group. 2002. *Final Report of the Oak Ridge Land Use Planning Focus Group*. September. Available online at http://landuseplanning.ornl.gov/focus_group/focus_group_report.pdf.
- ORNL (Oak Ridge National Laboratory). 2002a. *Land Use Technical Report*. ORNL/TM-2002/132. Prepared by SAIC for ORNL, Oak Ridge, Tenn. Available online at http://landuseplanning.ornl.gov/technical_report/UT-B_Final_Land_Use_Report.pdf.
- ORNL. 2002b. *Oak Ridge National Laboratory Land and Facilities Plan*. ORNL/TM-2002/1. Oak Ridge National Laboratory, Oak Ridge, Tenn. August.
- ORNL. 2007. *Oak Ridge National Laboratory Ten-Year Site Plan, FY 2009 to FY 2018*. ORNL/TM-2007/15. Oak Ridge National Laboratory, Oak Ridge, Tenn. May.
- Parr, P.D., and J.F. Hughes. 2006. *Oak Ridge Reservation Physical Characteristics and Natural Resources*. ORNL/TM-2006/110. Oak Ridge National Laboratory, Oak Ridge, Tenn. October.

Ryon, M.G., P.D. Parr, and K. Cohen. 2007. *Native Grass Community Management Plan for the Oak Ridge Reservation*. ORNL/TM-2007/038. Oak Ridge National Laboratory, Oak Ridge, Tenn. June.