

Oak Ridge Reservation

**Annual Site  
Environmental Report**

DOE/ORO/2418



**2011**

Oak Ridge Reservation

**Annual Site  
Environmental  
Report 2011**

Cover Image and Design  
Creative Media  
Communications  
Oak Ridge National Laboratory

**Oak Ridge Reservation Annual Site Environmental Report for 2011**

on the World Wide Web  
[http://www.ornl.gov/sci/env\\_rpt/](http://www.ornl.gov/sci/env_rpt/)

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September 2012

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P.O. Box 2008, Oak Ridge, TN 37831-2008  
Managed by UT-Battelle, LLC,  
for the Department of Energy under Contract DE-AC05-00OR22725  
and by  
the Y-12 National Security Complex  
Oak Ridge, TN 37831-8169  
Managed by B&W Technical Services Y-12 L.L.C.  
for the Department of Energy under Contract DE-AC05-00OR22800  
and by  
URS | CH2M Oak Ridge LLC  
Managing and Safely Delivering the Department of Energy's Vision  
for the East Tennessee Technology Park Mission  
under Contract DE-SC-0004645



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# Acronyms and Abbreviations

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AAS	ambient air station
ABC	aluminum beverage can (recycling—Y-12 Complex)
ACO	Analytical Chemistry Organization (Y-12 Complex)
ACM	asbestos-containing material
AGL	above ground level
ALARA	as low as reasonably achievable
AMAD	activity median aerodynamic diameter
ANSI	American National Standards Institute
ANSI/HPS	ANSI Health Physics Society (standard)
AOEC	Agent Operations Eastern Command (NNSA OST)
ARAP	Aquatic Resource Alteration Permit
ARAR	applicable or relevant and appropriate requirement
ARRA	American Recovery and Reinvestment Act
ASER	Annual Site Environmental Report
ATSDR	Agency for Toxic Substances and Diseases Registry
AWQC	ambient water quality criteria
B&W Y-12	B&W Technical Services Y-12 L.L.C.
BCG	biota concentration guide
BCK	Bear Creek kilometer
BJC	Bechtel Jacobs, Inc., LLC
BMAP	Biological Monitoring and Abatement Program
BRW	bedrock well
CAA	Clean Air Act
CAP-88	Clean Air Assessment Package (software)
CD	Critical Design
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CH	contact-handled
CNF	Central Neutralization Facility
CO <sub>2</sub> e	CO <sub>2</sub> equivalent
COC	contaminant of concern
COD	Chemical oxygen demand
CPU	central processing unit
CRK	Clinch River kilometer
CROET	Community Reuse Organization of East Tennessee
CRT	Cathode-ray tube
CSB	Computational Sciences Building (ORNL)
CWA	Clean Water Act

## Oak Ridge Reservation

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CWTS	Chromium Water Treatment system
CX	categorical exclusion
CY	calendar year
D&D	decontamination and decommissioning
D <sup>3</sup>	deactivation, demolition, and disposition
DAC	derived air concentration
DCA	dichloroethane
DCE	dichloroethene
DCG	derived concentration guide
DCS	derived concentration standard
DNAPL	dense nonaqueous phase liquid
DOE	US Department of Energy
DOE HSS	DOE Office of Health, Safety and Security
DOE ORO	DOE Oak Ridge Office
DRH	Division of Radiological Health (TDEC)
EB	existing building
EC&P	Environmental Compliance and Protection
ECD	Environmental Compliance Department (Y-12 Complex)
ECM	energy conservation measure
ECR	environmental compliance representative
ED	effective dose
EFK	East Fork Poplar Creek kilometer
EFPC	East Fork Poplar Creek
EISA	Energy Independence and Security Act
EM	Office of Environmental Management (DOE)
EMMIS	Environmental Monitoring Management Information System (Y-12 Complex)
EMPO	Emergency Management Program Office (Y-12 Complex)
EMPO	Environmental Management Program Office (ORNL)
EMS	Environmental Management System
EMWMF	Environmental Management Waste Management Facility
EO	executive order
EPA	US Environmental Protection Agency
EPACT	Energy Policy Act
EPCRA	Emergency Planning and Community Right-to-Know Act
EPEAT	Electronic Product Environmental Assessment Tool
EPO	environmental protection officer
EPT	<i>Ephemeroptera, Plecoptera, and Trichoptera (taxa)</i>
EP&WSD	Environmental Protection and Waste Services Division
ERO	emergency response organization
ES&H	environment safety, and health
ESPC	Energy Savings Performance Contract
ETTP	East Tennessee Technology Park

EU	exposure unit
EV	electronic vehicle
FCK	First Creek kilometer
FEC	Federal Electronics Challenge
FFA	federal facility agreement
FFCA	Federal Facilities Compliance Agreement
FFK	Fifth Creek kilometer
FIRP	Facilities and Infrastructure Recapitalization Program (Y-12 Complex)
FONSI	finding of no significant impact
FSC	Federal Special Concern
FSE	full-scale exercise (Y-12 Complex)
FY	fiscal year
GCK	Grassy Creek kilometer
GET	General Employee Training
GHG	greenhouse gas
GI	green infrastructure
GSA	General Services Administration
GSF	gross square feet
HAP	hazardous air pollutant
HCC	Halcyon Commercialization Center
HEPA	high-efficiency particulate air
HEUMF	Highly Enriched Uranium Materials Facility
HFIR	High Flux Isotope Reactor
HPSB	high-performance sustainable building
HQ	hazard quotient
HSS	Office of Health, Safety and Security (DOE)
HVAC	heating, ventilating, and air-conditioning
I/CATS	Issues and Corrective Action Tracking System (UCOR)
IDMS	Integrated Document Management System (UT-Battelle)
I/I	inflow/infiltration
IC <sub>25</sub>	inhibition concentration (the concentration of effluent that causes a 25% reduction in survival, reproduction, and/or growth of monitored species)
ICP	inductively coupled plasma
ICP-MS	inductively coupled plasma–mass spectrometer
ID	identification (number)
IFDP	Integrated Facility Disposition Project
ILA	industrial landscaping and agricultural
ISK	Ish Creek kilometer
ISMS	integrated safety management system
ISO	International Organization for Standardization

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Isotek	Isotek Systems LLC
IT	information technology
LCD	liquid crystal display
LED	light-emitting diode
LEED	Leadership in Energy and Environmental Design
LGTF	Liquids and Gaseous Treatment Facility
LI	low impact
LIMS	Laboratory Information Management System (Y-12 Complex)
LLW	low-level waste
MACT	Maximum Achievable Control Technology
MBK	Mill Branch kilometer
MCK	McCoy Branch kilometer
MCL	maximum contaminant level
MDA	minimum detectable activity
MEI	maximally exposed individual
MEK	Melton Branch kilometer
MGY	million gallons per year
MIK	Mitchell Branch kilometer
MLF	Multiprogram Laboratory Facility
MMES	Martin Marietta Energy Systems
MT	meteorological tower
MVSP	Melton Valley Steam Plant (ORNL)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NIST	National Institute of Standards and Technology
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NOAA	National Oceanic and Atmospheric Administration
NOV	notice of violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List (EPA)
NRC	US Nuclear Regulatory Commission
NSF-ISR	NSF International Strategic Registrations, Ltd.
NSPS	New Source Performance Standard
NTRC	National Transportation Research Center
NT-3	Boneyard/Burnyard
NWTK	Northwest Tributary kilometer



ODS	ozone-depleting substance
ORAU	Oak Ridge Associated Universities
OREIS	Oak Ridge Environmental Information System (ORNL)
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations
ORPS	Occurrence Reporting and Processing System (Y-12 Complex)
ORR	Oak Ridge Reservation
ORRL	Oak Ridge Reservation Landfill
ORSSAB	Oak Ridge Site Specific Advisory Board
ORSTP	Oak Ridge Science and Technology Park
OST	Office of Secure Transportation
P2	designation for an on-site ORNL wetland
POA	Poplar Creek Orange
PAM	perimeter air monitoring (station)
PCB	polychlorinated biphenyl
PCCR	phased construction completion report
PCE	tetrachloroethene
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to 10 µm
PM <sub>2.5</sub>	fine particulate matter with an aerodynamic diameter less than or equal to 2.5 µm
POTW	publicly owned treatment works
PSD	Prevention of Significant Deterioration
PUE	power usage effectiveness
PWTC	Process Waste Treatment Complex
QA	quality assurance
QC	quality control
R&D	research & development
RA	remedial action
Rad-NESHAP	National Emission Standards for Hazardous Air Pollutants for Radionuclides
RATA	Relative Accuracy Test Audit
RAWP	remedial action work plan
RCK	Raccoon Creek kilometer
RCRA	Resource Conservation and Recovery Act
REC	renewable energy certificate
REDC	Radiochemical Engineering Development Center
RER	remediation effectiveness report
RESRAD	residual radioactivity
RfC	reference concentration
RFID	radio frequency identification

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RFITS	Radio Frequency Identification Transportation System
RH	remote-handled
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RQ	reportable quantity (CERCLA)
SAA	satellite accumulation area
SAP	sampling and analysis plan
SARA	Superfund Amendments and Reauthorization Act
SBMS	Standards-Based Management System (UT-Battelle)
SC	Office of Science
SCK	Scarboro Creek kilometer
SD	storm water outfall
SDWA	Safe Drinking Water Act
SEC	SEC Federal Services Corporation
SME	subject matter expert
SMO	Sample Management Office
SNAP	Significant New Alternatives Program (Y-12 Complex)
SNM	special nuclear material
SNS	Spallation Neutron Source
SODAR	sonic detection and ranging
SOW	statement of work
SPCC	spill prevention, control, and countermeasures (plan)
SPMD	semipermeable membrane device
SPWTF	Steam Plant Wastewater Treatment Facility
SSP	site sustainability plan
SSPP	Strategic Sustainability Performance Plan (DOE)
STP	sewage treatment plant
SU	standard unit
SVOC	semivolatile organic compound
SWEIS	sitewide environmental impact statement
SWHIS	Surface Water Hydrological Information Support System (Y-12 Complex)
SWP3	Storm Water Pollution Prevention Program
SWSA	solid waste storage area
TAPCR	Tennessee Air Pollution Control Regulations
TCA	trichloroacetic acid
TCC&I	Tennessee Chamber of Commerce and Industry
TCE	trichloroethene/trichloroethylene
TDEC	Tennessee Department of Environment and Conservation
TEAM	Transformational Energy Action Management
TEMA	Tennessee Emergency Management Agency
TOA	Tennessee Oversight Agreement

TOC	Total organic carbon
TP3	Tennessee Pollution Prevention Partnership
TRI	toxic release inventory
TRO	total residual oxidant
TRU	transuranic
TSCA	Toxic Substances Control Act
TSS	total suspended solids
TVA	Tennessee Valley Authority
TWA	time-weighted average
TWPC	Transuranic Waste Processing Center
TWRA	Tennessee Wildlife Resources Agency
UCOR	URS   CH2M Oak Ridge LLC
UEFPC	Upper East Fork Poplar Creek
UMC	unnneeded materials and chemicals
UNW	unconsolidated well
UPF	Uranium Processing Facility
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
UST	underground storage tank
UT	University of Tennessee
VOC	volatile organic compound
WAI	Wastren Advantage, Inc.
WBK	Walker Branch kilometer
WCK	WOC kilometer
WEMA	West End Mercury Area
WIPP	Waste Isolation Pilot Plant
WOC	White Oak Creek
WOD	White Oak Dam
WQC	water quality criteria
WQPP	water quality protection plan
WRRP	Water Resources Restoration Program
WSR	waste services representative
Y-12 Complex	Y-12 National Security Complex
YSO	Y-12 Site Office
ZPR	Zero Power Reactor



# Units of Measure and Conversion Factors\*

Units of measure and their abbreviations			
becquerel	Bq	millicurie	mCi
British thermal unit	Btu	milligram	mg
centimeter	cm	milliliter	mL
curie	Ci	millimeter	mm
day	day	million	M
degrees Celsius	°C	millirad	mrad
degrees Fahrenheit	°F	millirem	mrem
foot	ft	millisievert	mSv
disintegrations per minute	dpm	minute	min
gallon	gal	nanogram	ng
gallons per minute	gal/min	nephelometric turbidity unit	NTU
gram	g	parts per billion	ppb
gross square feet	gsf	parts per million	ppm
hectare	ha	parts per trillion	ppt
hour	h	picocurie	pCi
joule	J	pound	lb
kilogram	kg	pounds per square inch	psi
kilometer	km	quart	qt
kilowatt	kW	rad	rad
liter	L	roentgen	R
megajoule	MJ	roentgen equivalent man	rem
megawatt	MW	second	s
megawatt-hour	MWh	sievert	Sv
meter	m	standard unit (pH)	SU
metric ton	MT	ton, short (2,000 lb)	ton
microcurie	μCi	yard	yd
microgram	μg	year	year
micrometer	μm		

## Quantitative prefixes

tera	$\times 10^{12}$	pico	$\times 10^{-12}$
giga	$\times 10^9$	nano	$\times 10^{-9}$
mega	$\times 10^6$	micro	$\times 10^{-6}$
kilo	$\times 10^3$	milli	$\times 10^{-3}$
hecto	$\times 10^2$	centi	$\times 10^{-2}$
deka	$\times 10^1$	deci	$\times 10^{-1}$

\* Due to differing permit reporting requirements and instrument capabilities, various units of measurement are used in this report. The provided list of units of measure and conversion factors is intended to help readers convert numeric values presented here as needed for specific calculations and comparisons.

**Unit conversions**

Unit	Conversion	Equivalent	Unit	Conversion	Equivalent
<b>Length</b>					
in.	× 2.54	cm	cm	× 0.394	in.
ft	× 0.305	m	m	× 3.28	ft
mile	× 1.61	km	km	× 0.621	mile
<b>Area</b>					
acre	× 0.405	ha	ha	× 2.47	acre
ft <sup>2</sup>	× 0.093	m <sup>2</sup>	m <sup>2</sup>	× 10.764	ft <sup>2</sup>
mile <sup>2</sup>	× 2.59	km <sup>2</sup>	km <sup>2</sup>	× 0.386	mile <sup>2</sup>
<b>Volume</b>					
ft <sup>3</sup>	× 0.028	m <sup>3</sup>	m <sup>3</sup>	× 35.31	ft <sup>3</sup>
qt (US liquid)	× 0.946	L	L	× 1.057	qt (US liquid)
gal	× 3.7854118	L	L	× 0.264172051	gal
<b>Concentration</b>					
ppm	× 1	mg/L	mg/L	× 1	ppm
<b>Weight</b>					
lb	× 0.4536	kg	kg	× 2.205	lb
ton, short	× 907.1847	kg	kg	× 0.00110231131	ton, short
<b>Temperature</b>					
°C	°F = (9/5) °C + 32	°F	°F	°C = (5/9) (F – 32)	°C
<b>Activity</b>					
Bq	× 2.7 × 10 <sup>-11</sup>	Ci	Ci	× 3.7 × 10 <sup>10</sup>	Bq
Bq	× 27	pCi	pCi	× 0.037	Bq
mSv	× 100	mrem	mrem	× 0.01	mSv
Sv	× 100	rem	rem	× 0.01	Sv
nCi	× 1,000	pCi	pCi	× 0.001	nCi
mCi/km <sup>2</sup>	× 1	nCi/m <sup>2</sup>	nCi/m <sup>2</sup>	× 1	mCi/km <sup>2</sup>
dpm/L	× 0.45 × 10 <sup>9</sup>	μCi/cm <sup>3</sup>	μCi/cm <sup>3</sup>	× 2.22 × 10 <sup>9</sup>	dpm/L
pCi/L	× 10 <sup>-9</sup>	μCi/mL	μCi/mL	× 10 <sup>9</sup>	pCi/L
pCi/m <sup>3</sup>	× 10 <sup>-12</sup>	μCi/cm <sup>3</sup>	μCi/cm <sup>3</sup>	× 10 <sup>12</sup>	pCi/m <sup>3</sup>

# Acknowledgments

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The ASER technical coordinators and project team wish to thank those who participated in the publication of the *Oak Ridge Reservation Annual Site Environmental Report*. Although we cannot name everyone involved in the environmental monitoring program, we would like to also thank and acknowledge those conducting sampling and analytical support.

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