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OAK RIDGE RESERVATION

2010

# Annual Site Environmental Report



The Oak Ridge Reservation

# Annual Site Environmental Report 2010

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# Acronyms and Abbreviations

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AAS	ambient air station
ACO	Analytical Chemistry Organization
ACM	asbestos-containing materials
ACOE	Army Corps of Engineers
AFV	alternative fuel vehicle
ALARA	as low as reasonably achievable
AOC	area of concern
AOEC	Agent Operations Eastern Command (NNSA OST)
ARAR	Applicable or Relevant and Appropriate Requirements
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	Babcock & Wilcox Technical Services Y-12
BCG	biota concentration guide
BCK	Bear Creek kilometer
BGSP	biomass gasification steam plant
BJC	Bechtel Jacobs Company LLC
BMAP	Biological Monitoring and Abatement Program, Plan
BRW	bedrock well
CA	corrective action
CAA	Clean Air Act
CAP-88	Clean Air Assessment software
CCC	Complex Command Center
CD	Critical Design
CEDR	Consolidated Energy Data Report
CEMS	continuous emission monitoring system
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CNF	Central Neutralization Facility
COC	contaminants of concern
COD	Chemical oxygen demand
COROH	Center for Oak Ridge Oral History
CRK	Clinch River kilometer
CROET	Community Reuse Organization of East Tennessee
CRT	cathode ray tube
CSMA	Closed Scrap Metal Area
CWA	Clean Water Act

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CX	categorical exclusion
CY	calendar year
D&D	deactivation and decommissioning
DAC	derived air concentration
DCE	Dichloroethane
DCG	derived concentration guide
DES	detailed energy survey
DNAPL	Dense Non-Aqueous Phase Liquid
DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy Office of Environmental Management
DOE-HSS	DOE Office of Health, Safety and Security
DOE-ORO	DOE Oak Ridge Office
DRH	Division of Radiological Health
EB	existing building
EC&P	Environmental Compliance and Protection
ECD	Environmental Compliance Department
ECM	energy conservation measure
ECR	environmental compliance representative
ED	effective dose
EDE	effective dose equivalent
EERE/FEMP	Energy Efficiency Research /Federal Energy Management Program
EFPC	East Fork Poplar Creek
EM	Environmental Management
EMMIS	Environmental Monitoring Management Information System
EMPO	Emergency Management Program Office (Y-12)
EMS	environmental management system
EMWMF	Environmental Monitoring Waste Management Facility
EPA	U.S. 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	Ephemeroptera, Plecoptera, and Trichoptera (taxa)
EP&WSD	Environmental Protection and Waste Services Division
ER	Environmental Restoration
ERO	emergency response organization
ES&H	Environment, Safety, and Health
ESD	Environmental Science Division
ESPC	Energy Savings Performance Contract
ETTP	East Tennessee Technology Park
EU	exposure unit

FCK	First Creek kilometer
FEC	Federal Electronics Challenge
FEMP	Federal Energy Management Program
FFA	Federal Facilities Agreement
FFCA	Federal Facilities Compliance Agreement
FFK	Fifth Creek kilometer
FGR	Federal Guidance Report
FIRP	Facilities and Infrastructure Recapitalization Program
FPE	full-participation exercise
FSC	Federal Special Concern
FY	fiscal year
GCK	Grassy Creek kilometer
GEM-JV	Gem Technologies Inc., Joint Venture
GET	General Employee Training
GHG	greenhouse gas
HC	hydrocarbon
HCC	Halcyon Commercialization Center
HEMS	high-energy mission-specific
HEPA	high-efficiency particulate air
HEUMF	Highly Enriched Uranium Materials Facility
HFIR	High Flux Isotope Reactor
HMIS	Hazardous Materials Information System
HPSB	High-Performance Sustainable Building
HQ	hazard quotient
HRE	Homogeneous Reactor Experiment
HRIBF	Holifield Radioactive Ion Beam Facility
HSS	Health, Safety and Security
I/CATS	Issues/Corrective Action Tracking System
ICP	inductively coupled plasma
ICP-MS	inductively coupled plasma–mass spectrometer
IDP	industrial discharge permit
IFDP	Integrated Facility Disposition Project
ILA	industrial landscaping and agricultural
ISK	Ish Creek kilometer
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
IT	information technology
LCD	liquid crystal display
LEARN	Local Education Administration Requirements Network
LED	light-emitting diode

## Oak Ridge Reservation

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LEED	Leadership in Energy and Environmental Design
LGTF	Liquids and Gaseous Treatment Facility
LIMS	Laboratory Information Management System
LMES	Lockheed Martin Energy Systems
MACT	Maximum Achievable Control Technology
MBK	Mill Branch kilometer
MCCBK	McCoy Branch kilometer
MCL	maximum contaminant level
MDA	minimum detectable activity
MDL	method detection limit
MEI	maximally exposed individual
MEK	Melton Branch kilometer
MH	manhole
MIK	Mitchell Branch kilometer
MLF	Modernization of Laboratory Facilities
MLF	Multiprogram Laboratory Facility
MMES	Martin Marietta Energy Systems
MOA	Memorandum of agreement
MT	meteorological tower
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 Nuclear Security Site
NOAA	National Oceanic and Atmospheric Administration
NOROH	Networking Oak Ridge Oral History
NOV	Notice of violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSPS	New Source Performance Standard
NTRC	National Transportation Research Center
NTS	Nevada Test Site
NT-3	Boneyard/Burnyard
NWTK	Northwest Tributary kilometer
ODS	ozone-depleting substance
ORAU	Oak Ridge Associated Universities
OREIS	Oak Ridge Environmental Information System
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
ORR	Oak Ridge Reservation
ORRL	Oak Ridge Reservation Landfills
ORSSAB	Oak Ridge Site Specific Advisory Board
ORSTP	Oak Ridge Science and Technology Park
OST	Office of Secure Transportation
OSTI	Office of Scientific and Technical Information
PAH	polycyclic aromatic hydrocarbon
PAM	perimeter air monitoring (station)
PCBs	polychlorinated biphenyls
PCCR	phased construction completion report
PCE	tetrachloroethene
PHEV	plug-in hybrid electric vehicles
PM	particulate matter
POTW	publicly owned treatment works
PPTRS	Pollution Prevention Tracking and Reporting
PSD	Prevention of Significant Deterioration
PWTC	Process Waste Treatment Complex
QA	quality assurance
QC	quality control
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
RESRAD	Residual Radioactivity
RfC	reference concentration
RFID	radio frequency identification
RI/FS	Remedial Investigation/Feasibility Study
ROD	record of decision
RQ	radiation quotient
RQ	reportable quantity
SAP	sampling and analysis plan
SARA	Superfund Amendments and Reauthorization Act
SBMS	Standards-Based Management System
SC	Office of Science



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SCK	Scarboro Creek kilometer
SDWA	Safe Drinking Water Act
SEP	Supplemental Environmental Project
SIP	State Implementation Plan
SME	Subject matter expert
SMO	Sample Management Office
SNAP	Significant New Alternatives Program
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
SSP	Site Sustainability Plan
SSPP	Strategic Sustainability Performance Plan
STARRT	Safety Task Analysis Risk Reduction Talk
STP	sewage treatment plant
STWTF	Steam Plant Wastewater Treatment Facility
SU	standard unit
SWEIS	Site-wide environmental impact statement
SWHISS	Surface Water Hydrological Information Support System
SWP3	Storm Water Pollution Prevention Program
SWSA	solid waste storage area
TAPCR	Tennessee Air Pollution Control Regulations
TCA	tetrachloroethane
TCC&I	Tennessee Chamber of Commerce and Industry
TCE	trichlorethene
TDEC	Tennessee Department of Environment and Conservation
TEAM	Transformational Energy Action Management
TEMA	Tennessee Emergency Management Agency
TMDL	Total Maximum Daily Load
TNDA	Tennessee Department of Agriculture
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
UEFPC	Upper East Fork Poplar Creek
UMC	Unneeded Materials and Chemicals
UNW	unconsolidated well
UPF	Uranium Processing Facility
USDA	United States Department of Agriculture
USGBC	United States Green Building Council
UST	underground storage tank
UT	University of Tennessee
UV	ultraviolet
VOC	volatile organic compound
WAI	Wastren Advantage Inc.
WBK	Walker Branch kilometer
WCK	White Oak Creek kilometer
WCM	water conservation measure
WIPP	Waste Isolation Pilot Plant
WMF	waste management facility
WOC	White Oak Creek
WOD	White Oak Dam
WPF	Waste Processing Facility
WQC	water quality criteria
WRRP	Water Resources Restoration Program
WSR	Waste Services Representative
WWTS	Waste Water Treatment System
YSO	Y-12 Site Office

# Units of Measure and Conversion Factors\*

## Units of measure and their abbreviations

becquerel	Bq	milliliter	mL
centimeter	cm	millimeter	mm
curie	Ci	million	M
day	day	millirad	mrad
degrees Celsius	°C	millirem	mrem
degrees Fahrenheit	°F	millisievert	mSv
foot	ft	minute	min
gallon	gal	nephelometric turbidity unit	NTU
gallons per minute	gal/min	parts per billion	ppb
gram	g	parts per million	ppm
hectare	ha	parts per trillion	ppt
hour	h	picocurie	pCi
inch	in.	pound	lb
kilogram	kg	pounds per square inch	psi
kilometer	km	quart	qt
kilowatt	kW	rad	rad
liter	L	roentgen	R
megawatt	MW	roentgen equivalent man	rem
meter	m	second	s
metric ton	MT	sievert	Sv
microcurie	μCi	standard unit (pH)	SU
microgram	μg	ton, short (2000 lb)	ton
micrometer	μm	yard	yd
millicurie	mCi	year	year
milligram	mg		

## 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 listing of units of measure and conversion factors is intended to help readers convert numeric values presented herein 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 (U.S. liquid)	× 0.946	L	L	× 1.057	qt (U.S. 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	× 907.1847	kg	kg	× 0.00110231131	ton
<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	× 1000	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>

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