Major Source Operating Permit Application for the U.S. Department of Energy Oak Ridge Y-12 National Security Complex Sources

This permit application consists of four volumes. The complete, unedited application consists of Volumes 1, 2, 3.2, and 4.3. Certain information provided in the complete application is controlled under the Atomic Energy Act of 1954, as amended, and under Executive Order 12356 of 1982. Volumes 3.1, 4.1, and 4.2, which were edited to meet these control requirements, are also provided.

When a volume is available in more than one classification level, then the volumes are presented as Volume X.1, which is the Unclassified version; Volume X.2, which is the Unclassified Controlled Nuclear Information (UCNI) version; and Volume X.3, which is the classified version. A listing of the volumes is provided below.

Y/TS-2130/Volume 1/ Rev. 0
Sitewide Information and Application Forms

Y/TS-2130/Volume 2/ Rev. 0
Applications for Emission Sources in Buildings 9201-1, 9201-1W, 9204-2, 9212, 9401-3, 9401-7, 9767-4, 9767-13, 9811-6

Y/TS-2130/Volume 3.1/ Rev. 0 - Unclassified Version, **3.2** - UCNI Version
Applications for Emission Sources in Buildings 9201-5N, 9201-5W, 9202, 9401-5, 9998

Y/TS-2130/Volume 4.1/ Rev. 0 - Unclassified Version, **4.2** - UCNI Version, **4.3** - Classified Version **Applications for Emission Sources in Buildings 9204-2, 9204-2E, 9206, 9212, 9215, 9225-3**

Volume 1 - Sitewide Information and Application Forms

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS

1. ADMINISTRATION	
This application contains the following forms:	APC Form V.1, Facility Identification
	APC Form V.2, Operations and Flow Diagrams

2. EMISSIONS SOURCE DESCRIPTION		TOTAL NUMBER OF THIS FORM
This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc.):	APC Form V.3, Stack Identification	87
	APC Form V.4, Fuel Burning Non-Process Equipment	2
	APC Form V.5, Stationary Gas Turbines or Internal Combustion Engines	0
	APC Form V.6, Storage Tanks	0
	APC Form V.7, Incinerators	0
	APC Form V.8, Printing Operations	0
	APC Form V.9, Painting and Coating Operations	1
	APC Form V.10, Miscellaneous Processes	36
	APC Form V.33, Stage I and Stage II Vapor Recovery Equipment	0
	APC Form V.34, Open Burning	0

3. AIR POLLUTION CONTROL SYSTEM		TOTAL NUMBER OF THIS FORM
This application contains the following forms (one form for each control system in use at the facility):	APC Form V.11, Control Equipment - Miscellaneous	2
	APC Form V.12, Condensers	0
	APC Form V.13, Adsorbers	0
	APC Form V.14, Catalytic or Thermal Oxidation Equipment	0
	APC Form V.15, Cyclones/Settling Chambers	0
	APC Form V.16, Electrostatic Precipitators	0
	APC Form V.17, Wet Collection Systems	6
	APC Form V.18, Baghouse/Fabric Filters	28

MAJOR SOURCE OPERATING PERMIT APPLICATION - INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS

4. COMPLIANCE DEMONSTRATION		TOTAL NUMBER OF THIS FORM
This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc.):	APC Form V.19, Compliance Certification - Monitoring and Reporting - Description of Methods for Determining Compliance	38
	APC Form V.20, Continuous Emissions Monitoring	5
	APC Form V.21, Portable Monitors	0
	APC Form V.22, Control System Parameters or Operating Parameters of a Process	3
	APC Form V.23, Monitoring Maintenance Procedures	0
	APC Form V.24, Stack Testing	4
	APC Form V.25, Fuel Sampling and Analysis	1
	APC Form V.26, Record Keeping	7
	APC Form V.27, Other Methods	52
	APC Form V.28, Emissions from Process Emissions Sources / Fuel Burning Installations / Incinerators	38
	APC Form V.29, Emissions Summary for the Facility or for the Source Contained in This Application	1
	APC Form V.30, Current Emissions Requirements and Status	38
	APC Form V.31, Compliance Plan and Compliance Certification	1
	APC Form V.32, Air Monitoring Network	0

5. STATEMENT OF COMPLETENESS AND CERTIFICATION OF COMPLIANCE

I have reviewed this application in its entirety and to the best of my knowledge, and based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete. I have provided all the information that is necessary for compliance purposes and this application consists of [See Attachment 1] pages and they are numbered from page [See Attachment 1] to _____. The status of this facility's compliance with all applicable air pollution control requirements, including the enhanced monitoring and compliance certification requirements of the Federal Clean Air Act, is reported in this application, along with the methods to be used for compliance demonstration.

Name and Title of Responsible Official | Telephone Number with Area Code

See Attachment 1to Form V.Index

Signature of Responsible Official | Date of Application

See Attachment 1to Form V.Index

(FOR DEFINITION OF RESPONSIBLE OFFICIAL, SEE INSTRUCTIONS FOR APC FORM V.1)

Attachment 1
Form V. Index
Index of Air Pollution Permit Application Form
Part 5. Statement of Completeness and Certification of Compliance

I have reviewed this application in its entirety and to the best of my knowledge, and based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete. I have provided all the information that is necessary for compliance purposes and this application consists of _*_ pages and they are numbered from page _*_ to _*_. The status of this facility's compliance with all applicable air pollution control requirements, including the enhanced monitoring and compliance certification requirements of the Federal Clean Air Act, is reported in this application along with the methods to be used for compliance demonstration.

Theodore D. Sherry, Manager
National Nuclear Security Administration -Y-12 Site Office
Name and Title of Responsible Official

(865) 576-0752
Telephone Number with Area Code

Signature of Responsible Official

4/17/09
Date of Application

Michelle M. Reichert, Vice President ES&H
for B&W Technical Services Y-12, L.L.C.
Name and Title of Co-operator

(865) 241-5104
Telephone Number with Area Code

Michelle M. Reichert
Signature of Co-operator

04/13/09
Date of Application

The Y-12 Site Office (YSO) has signed this document as "owner or operator" and B&W Technical Services Y-12, L.L.C. (B&W Y-12) agrees to serve as "co-operator" of air emission sources operated in performing YSO mission activities at the Y-12 Complex. YSO and B&W Y-12 agree that dual signatures best reflect the actual apportionment of responsibility under federal law and the federal contract awarded to B&W Y-12. YSO responsibilities include making decisions regarding policy, funding, program management, project prioritization, and scheduling. B&W Y-12 is responsible for day-to-day activities, including but not limited to: identifying compliance requirements, requesting funding from YSO when necessary to take steps to achieve compliance, implementing plans and schedules approved by YSO, development of operating criteria, technical operations, maintenance, monitoring, sampling and analysis, record keeping, report preparation and submission, and contingency planning and emergency response coordination. For purposes of certification, YSO and B&W Y-12 representatives certify to the truth, accuracy, and completeness of the document for their respective areas of responsibility.

*Certain information provided in the complete application is controlled under the Atomic Energy Act of 1954, as amended, and under Executive Order 12356 of 1982. The complete application consists of:

Volume No.	Pages Numbered From:	Classification Level
1	1-96	Unclassified
2	1-177	Unclassified
3.2	1-116	Unclassified Controlled Nuclear Information
4.3	1-289	Classified
Total Pages	678	

Edited volumes are also provided as follows:

Volume No.	Pages Numbered From:	Classification Level
3.1	1-101	Unclassified
4.1	1-198	Unclassified
4.2	1-265	Unclassified Controlled Nuclear Information

ACRONYMS

AEA	Atomic Energy Act of 1954
AP-42	U.S. Environmental Protection Agency's Compilation of Air Pollutant Emissions
APC	air pollution control
As	Arsenic
ASTM	American Society for Testing and Materials
Ba	barium
Be	beryllium
BeO	beryllium oxide
BID	Background Information Document
BMP	best management practice
B&W Y-12	B&W Technical Services Y-12, L.L.C.
CAA	Clean Air Act
CAAA	Clean Air Act Amendment of 1990
Cd	Cadmium
CEM	continuous emissions monitor
CFM	cubic feet per minute
CFR	Code of Federal Regulations
C_i	curie
Cl_2	chlorine gas
Co	cobalt
CO	carbon monoxide
Cr	chromium
Cu	copper
CY	calendar year
°C	degrees Celsius
dc	direct current
dp	differential pressure
DP	Defense Program of the DOE
DOE	U.S. Department of Energy
DU	depleted uranium
e.g.	for example
ECD	Environmental Compliance Department
EDE	effective dose equivalent
EM	(Office of) Environmental Restoration and Waste Management
EPA	Environmental Protection Agency
EO	environmental officer
ESRN	Emission Source Reference Number
EU	enriched uranium
ft	foot
ft^2	square foot
ft^3	cubic foot
FY	fiscal year
°F	degrees Fahrenheit
g	gram
gal	gallon
gr/dscf	grains per dry standard cubic foot

ACRONYMS (Cont.)

HAP	hazardous air pollutant(s)
HCl	hydrogen chloride
HEPA	high-efficiency particulate air (filter)
HEU	highly enriched uranium
HF	hydrogen fluoride
Hg	mercury
HNO_3	nitric acid
HVAC	heating, ventilation, and air conditioning
hr	hour
i.e.	that is
in.	inch
kg	kilogram
lb	pound
lb-mol	pound-mole
Li	lithium
LMES	Lockheed Martin Energy Systems, Inc.
LPR	lithium process replacement (project)
m	meter
MAA	Material Access Area
MACT	Maximum Available Control Technology
MM Btu	million British thermal units
MCF	million cubic feet
min	minute
misc	miscellaneous
Mo	molybdenum
mo	month
mol	mole
mol. wt/MW	molecular weight
MOU	Memorandum of Understanding
Mn	manganese
mrem	millirem
MSDS	Material Safety Data Sheet
N/A	not applicable
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NG	natural gas
Ni	nickel
NNSA	National Nuclear Security Administration
NOx	nitrogen oxide
NRC	Nuclear Regulatory Commission
NSPS	New Source Performance Standards
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
oz	ounce
part	particulate
Pb	lead
PCB	polychlorinated biphenyls

ACRONYMS (Cont.)

PM	particulate matter
ppm	parts per million
RAD	radioactive
Rad-NESHAP	National Emission Standards for Hazardous Air Pollutants for Radionuclides
RCRA	Resource Conservation and Recovery Act
R&D	research and development
reg	regulation
rev	revision
RH	relative humidity
°R	degrees Rankine
Se	selenium
sec	second
SIC	Standard Industrial Code
soln	solution
SO_2	sulfur dioxide
sp gr	specific gravity
TAPCR	Tennessee Air Pollution Control Regulations
TDEC	Tennessee Department of Environment and Conservation
TN/Tenn	Tennessee
TOA	Tennessee/U.S. Department of Energy Oversight Agreement
TOC	Total Organic Compound
TVA	Tennessee Valley Authority
um	micrometer
U	uranium
UCNI	Unclassified Controlled Nuclear Information
UCOF	Uranium Chip Oxidation Facility
U.S.	United States
V	vanadium
VOC	volatile organic compound
wt%	weight percent
yr	year
Y-12 Complex	Y-12 National Security Complex
Zn	Zinc

1.0 Introduction

As a major source of air pollutants, the Oak Ridge Y-12 National Security Complex (Y-12 Complex) is required to obtain a Title V operating permit pursuant to Tennessee Department of Environment and Conservation (TDEC), Division of Air Pollution Control Regulation 1200-3-9-.02(11). The initial Title V Permit 554701 for the Y-12 Complex was issued on October 21, 2004, and expires October 21, 2009. A separate permit for a single source located at the Y-12 Complex, Permit 554594, was also issued at the same time. Actions taken to keep the permits up-to-date are presented in Section 6.0.

This permit application is being submitted to renew the two Title V permits, 554701 and 554594, as one combined permit under Permit 554701. When these permits were first issued, the sources were funded under two separate Department of Energy (DOE) programmatic budgets which were operated by two different contractors. That is no longer the case. Both permits are now under the National Nuclear Security Administration (NNSA), a semi-autonomous entity under DOE; operated by the same contractor; and under the same responsible official. Combining the permits will eliminate duplicate reporting.

This permit renewal application was prepared in accordance with TDEC regulations and the streamlining and simplification guidance found in the Environmental Protection Agency (EPA) "White Papers." The EPA has published several guidance documents or "White Papers" designed to streamline and simplify the development of Title V permit applications. In response to these documents, the TDEC adopted a board order (Order Number 96-93) which allows major sources in Tennessee to take advantage of the "White Paper" guidance in the preparation of Title V permit applications.

2.0 Site Description and Location

The Y-12 Complex, managed by the NNSA, is located on the DOE Oak Ridge Reservation (ORR) immediately adjacent to the city of Oak Ridge. The closest residential area lies approximately one-half mile to the north-northeast of the Y-12 Complex.

The city of Oak Ridge lies in a valley between the Cumberland and Blue Ridge mountain ranges and is bordered on two sides by the Clinch River. The Cumberland Mountains are 10 miles to the northwest; the Blue Ridge Mountains, which include the Great Smoky Mountains National Park, are 32 miles to the southeast (Fig. 2.1).

The ORR lies within the corporate limits of the city of Oak Ridge and encompasses all of the contiguous land owned by DOE in the Oak Ridge area. The residential section of Oak Ridge forms the northern boundary of the reservation. The Tennessee Valley Authority's (TVA) Melton Hill and Watts Bar reservoirs on the Clinch and Tennessee rivers form the southern and western boundaries (Fig. 2.2).

The Y-12 Complex is a large industrial complex supporting several hundred buildings or other facilities totaling approximately 6 million square feet of floor space (Fig. 2.3). The Y-12 Complex was constructed as part of the World War II Manhattan Project. The site's first mission was the separation of U-235 from natural uranium by electromagnetic separation. The electromagnetic separators were taken out of commission at the end of 1946, when gaseous diffusion became the accepted process for enriching uranium.

Until 1992, the primary mission of the Y-12 Complex was the production and fabrication of nuclear weapons components. Activities associated with these functions included production of lithium compounds, recovery of enriched uranium from scrap material, and fabrication of uranium and other materials into finished parts. Fabrication operations included vacuum casting, arc melting, powder compaction, rolling, forming, heat treating, machining, inspection and testing.

Today, the Y-12 Complex plays an important role in U.S. national security and is a one-of-a-kind facility in the NNSA Nuclear Security Enterprise. The Y-12 Complex roles include:

- 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.

The Y-12 Complex 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. For more information, visit the Y-12 Complex home page at http://www.y12.doe.gov/.

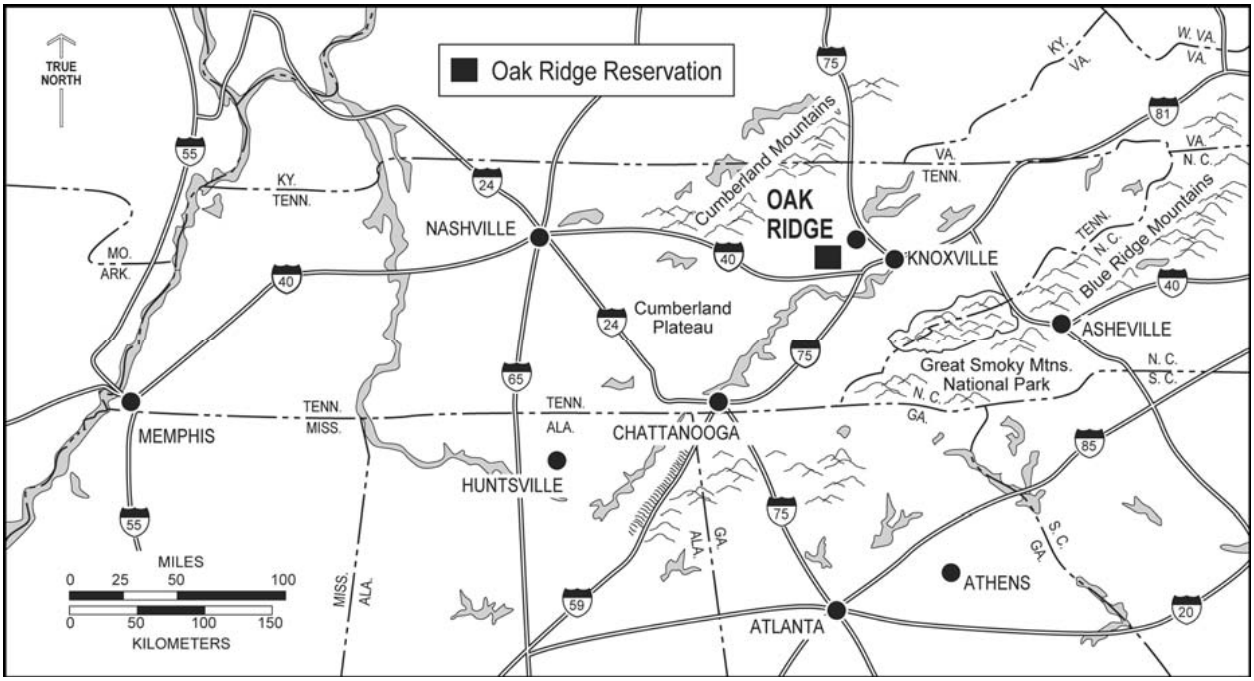
TRUE NORTH
Oak Ridge Reservation
KY.
TENN.
MO.
ARK.
NASHVILLE
Cumberland Mountains
OAK RIDGE
VA.
TENN.
KNOXVILLE
KY.
VA.
W. VA.
VA.
VA.
N. C.
TENN.
N. C.
Blue Ridge Mountains
ASHVILLE
Cumberland Plateau
Great Smoky Mtns. National Park
N. C.
S. C.
N. C.
GA.
MEMPHIS
TENN.
MISS.
TENN.
ALA.
CHATTANOOGA
HUNTSVILLE
ALA.
GA
S. C.
GA.
ATHENS
ATLANTA
MISS.
ALA.
MILES
0 25 50 100
0 50 100 150
KILOMETERS
55
24
40
75
65
59
81
85
20

Figure 2.1

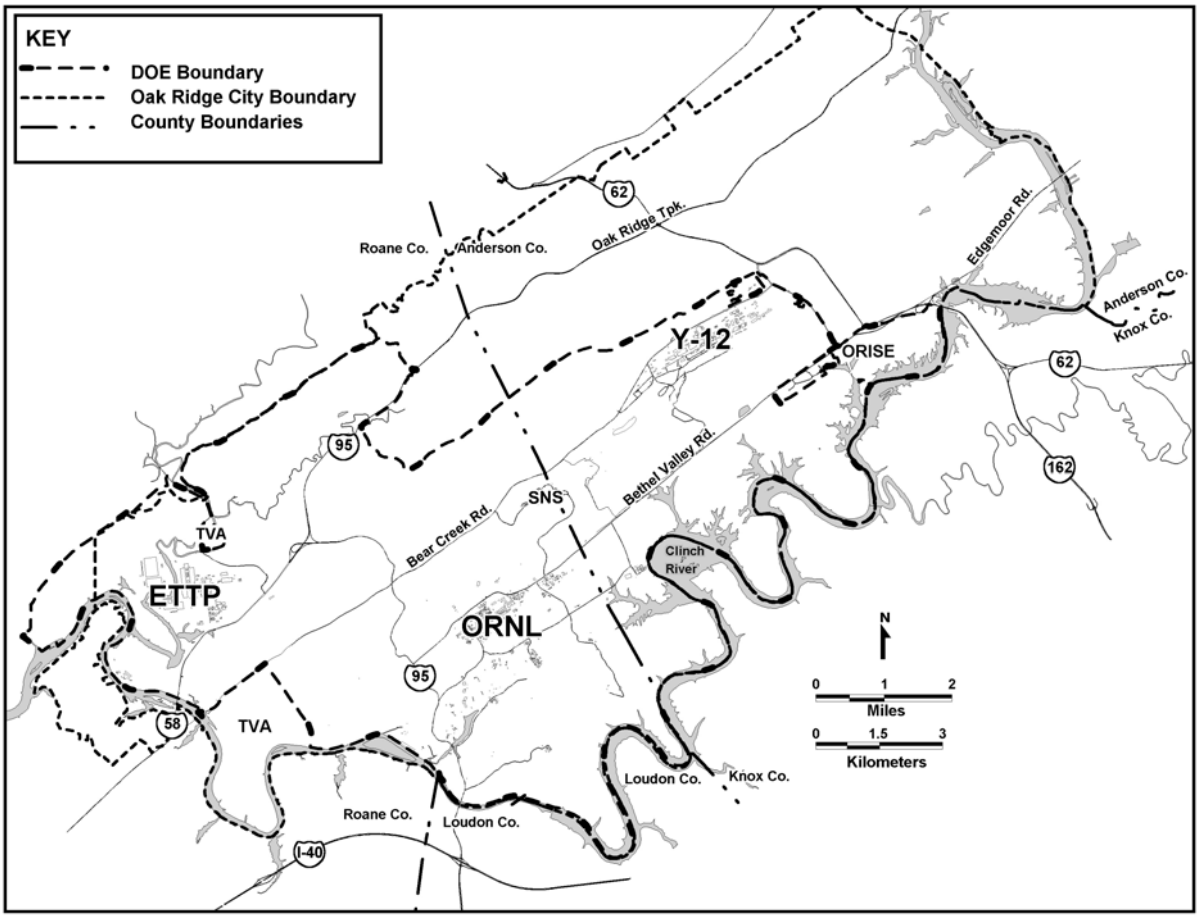
KEY
DOE Boundary
Oak Ridge City Boundary
County Boundaries
Roane Co.
Anderson Co.
Oak Ridge Tpk.
62
Edgemoor Rd.
Anderson Co.
Knox Co.
Y-12
ORISE
62
162
95
Bethel Valley Rd.
SNS
Bear Creek Rd.
TVA
Clinch River
ETTP
ORNL
N
95
0 1 2
Miles
0 1.5 3
Kilometers
58
TVA
Loudon Co.
Knox Co.
Roane Co.
Loudon Co.
I-40

Figure 2.2

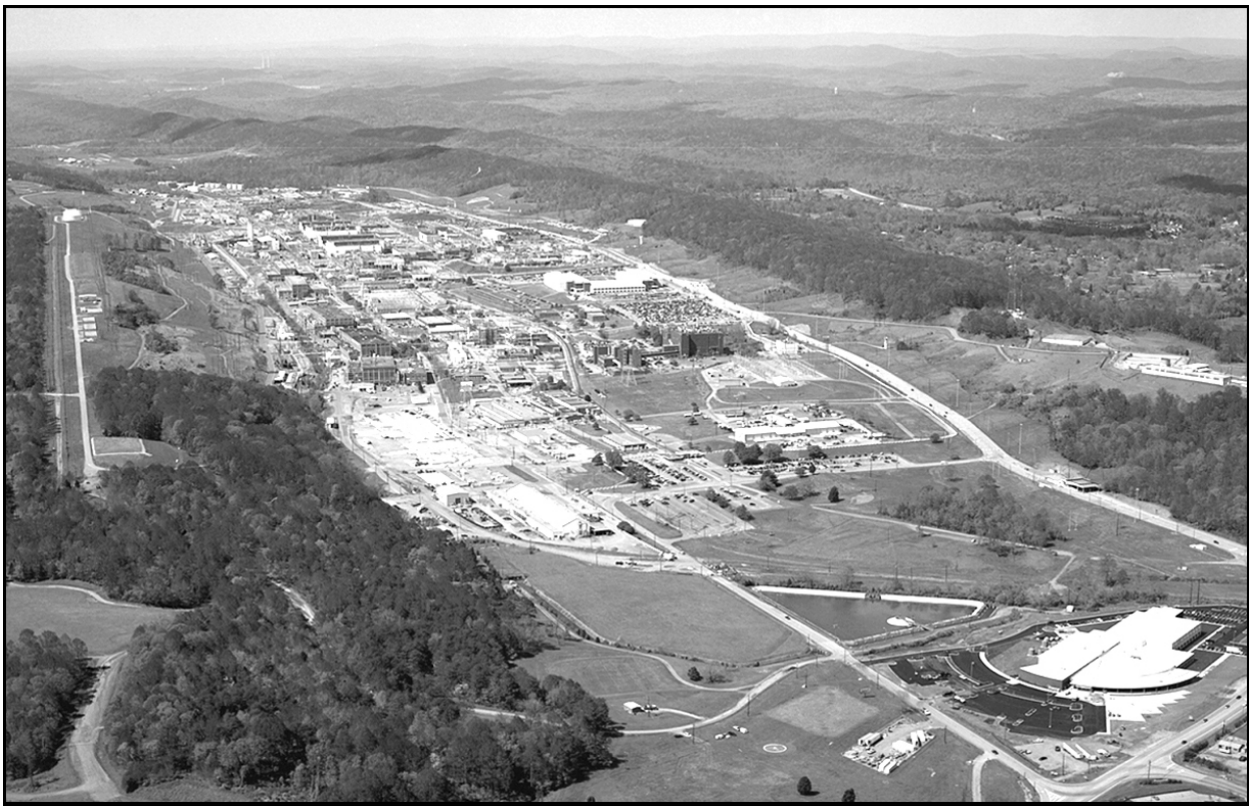

Figure 2.3

3.0 Major Source Applicability

A facility is subject to Title V at both the federal and state level if it meets the definition of major source. Sources required to obtain air permits include (a) major sources that emit 100 tons per year or more of any regulated air pollutant; (b) any source subject to the Hazardous Air Pollution (HAP) provisions of Title III - the threshold for HAP is set at 10 tons per year for a single HAP and 25 tons per year for a mixture of HAPs, where no one pollutant exceeds the 10-ton single pollutant threshold; (c) any source subject to the acid rain provisions of Title IV; (d) any source subject to New Source Performance Standards; and (e) any source subject to new source review under the nonattainment or Prevention of Significant Deterioration provisions.

In accordance with TDEC Rule 1200-3-9-.02(11)(b)14(i), the Oak Ridge Y-12 Complex is classified as a major source under Section 112 of the Clean Air Act (CAA). That is, the Y-12 Complex has the potential to emit 10 tons per year or more of a HAP which has been listed in Section 112(b) of CAA, or 25 tons per year or more of combined HAPs. For example, the Y-12 Complex emits greater than 10 tons per year of methanol and greater than 25 tons per year for a mixture of HAPs such as acetonitrile, chlorine, hydrochloric acid, hydrogen fluoride (hydrofluoric acid), etc., where no one pollutant exceeds the 10-ton single pollutant threshold. Following shutdown of the existing steam plant and discontinuation of coal combustion, the Y-12 Complex is expected to be below the collective 25-ton HAP threshold.

In addition, the Y-12 Complex is also classified as a major source having the potential to emit 100 tons per year or more of regulated air pollutants in accordance with TDEC Rule 1200-3-9-.02(11)(b)14(ii). Allowable emissions at the existing Y-12 Steam Plant are greater than 100 tons per year of regulated air pollutants for particulates, sulfur dioxides, and nitrogen oxides. Allowable emissions for the replacement steam plant are all below 100 tons per year. It should be noted, however, the replacement steam plant is subject to New Source Performance Standards (NSPS).

The TDEC rules define “major source” to include any stationary source (or sources) belonging to a single major industrial grouping. For the purposes of defining a “major source,” a group of stationary sources shall be considered part of a single industrial grouping if all of the pollutant-emitting activities belong to the same major group (i.e., all have the same two-digit code) as described in the Standard Industrial Classification Manual, 1987. The primary activities of the Y-12 Complex are identified under Major Group 34, Fabricated Metal Products, except for machinery and transportation equipment. Therefore, Major Group 34 will be used to classify the Y-12 Complex for the Title V Major Source Operating Permit Program. In 1997, Standard Industrial Classification codes were replaced with North American Industry Classification System Codes (NAICS). The corresponding NAICS number is Code 332, Fabricated Metal Product Manufacturing.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L &C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION

1. FACILITY NAME AND OWNER'S NAME IF DIFFERENT FROM THE FACILITY NAME: U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	FOR	APC COMPANY NO.
MAILING ADDRESS (ST/RD/P.O. BOX): P. O. BOX 2009	APC	LOG/PERMIT NO.
CITY, STATE, ZIP CODE: OAK RIDGE, TENNESSEE 37831	USE ONLY	

2. FACILITY LOCATION (ST/RD/HWY): COUNTY NAME: Anderson
BEAR CREEK ROAD

CITY OR DISTANCE TO NEAREST TOWN, ZIP CODE: TELEPHONE NUMBER WITH AREA CODE:
OAK RIDGE, TENNESSEE 37831

3. FACILITY'S PRIMARY ACTIVITY AND THE FIRST TWO DIGITS OF THE FACILITY SIC CODE(S):
FABRICATED METAL PRODUCTS
SIC CODE: 34

4. CONTACT PERSON'S NAME FOR THIS PERMIT: TITLE: TELEPHONE NUMBER WITH AREA CODE
THEODORE D. SHERRY MANAGER, Y-12 SITE OFFICE FOR DEPARTMENT OF ENERGY (865) 576-0752

5. IF FACILITY IS LOCATED IN AN AREA DESIGNATED AS "NONATTAINMENT" OR "ADDITIONAL CONTROL", INDICATE THE POLLUTANT (S) FOR THE DESIGNATION. PM 2.5, Ozone EAC

6. LIST ALL VALID AIR POLLUTION PERMITS ISSUED TO THE SOURCES CONTAINED IN THIS APPLICATION [IDENTIFY ALL PERMITS WITH MOST RECENT PERMIT NUMBERS AND EMISSION SOURCE REFERENCE NUMBERS LISTED ON THE PERMIT(S)].

Permit 554701, Title V Operating Permit, ESRN 01-0020 & 01-1020
Permit 554594, Title V Operating Permit, ESRN 01-0020
Permit 956248P, Special Material Facility, ESRN 01-0020-27
Permit 861316, CAIR Permit, ESRN 01-0020
Permit 960947F, Steam Plant, ESRN 01-0020-09

7. PERMIT REQUESTED FOR:

INITIAL APPLICATION TO OPERATE : _____ RELOCATION TO OPERATE : _____

MODIFICATION : _____ PERMIT RENEWAL TO OPERATE : ____X___.

REVISION (ADMINISTRATIVE AMENDMENTS) : _____

8. OWNER'S REGISTERED AGENT'S NAME & ADDRESS FOR SERVICE OF PROCESS TELEPHONE NUMBER WITH AREA CODE

N/A

9. IS THIS FACILITY SUBJECT TO THE PROVISIONS GOVERNING PREVENTION OF ACCIDENTAL RELEASES OF HAZARDOUS AIR CONTAMINANTS CONTAINED IN CHAPTER 1200-3-32 OF THE TENNESSEE AIR POLLUTION CONTROL REGULATIONS?

_____ YES ___XX___ NO

IF THE ANSWER IS YES, ARE YOU IN COMPLIANCE WITH THE PROVISIONS OF CHAPTER 1200-3-32 OF THE TENNESSEE AIR POLLUTION CONTROL REGULATIONS?

_____ YES _____ NO

10. PAGE NUMBER : REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
OPERATIONS AND FLOW DIAGRAMS

1. PLEASE LIST, IDENTIFY AND DESCRIBE BRIEFLY PROCESS EMISSION SOURCES, FUEL BURNING INSTALLATIONS, AND INCINERATORS THAT ARE CONTAINED IN THIS APPLICATION. PLEASE ATTACH A FLOW DECAGRAM FOR THIS APPLICATION.

See attachment 1 to Form V.2

Flow diagrams are provided in unedited Volumes 2-4

2. LIST ALL INSIGNIFICANT ACTIVITIES WHICH ARE EXEMPTED BECAUSE OF SIZE OR PRODUCTION RATE AND CITE THE APPLICABLE REGULATIONS.

Sources subject to TDEC Rule 1200-3-9-.04(5)(a)4.(i) – Any air emissions from an emissions unit or activity at a stationary source for which the emissions unit or activity has a potential to emit less than 5 tons per year of each regulated air pollutant that is not a hazardous air pollutant, and less than 1,000 pounds per year of each hazardous air pollutant. Such emission units and activities or types of emission units and activities must be listed in the permit application.

Sources subject to TDEC Rule 1200-3-9-.04(5)(f)(19) – Laboratory equipment, used for research and development or for chemical and physical analyses, including ventilating and exhaust systems for laboratory hoods used for air contaminants.

See Attachment 2 to Form V.2 for sources subject to Rule 1200-3-9-.04(5)(a)4(iv)

3. ARE THERE ANY STORAGE PILES?

YES _____XX_____ NO _____

4. LIST THE STATES THAT ARE WITHIN 50 MILES OF YOUR FACILITY

KENTUCKY, NORTH CAROLINA

5. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

Attachment 1 to Form V.2

APC V.2 EMISSION UNIT DESCRIPTIONS

The Y-12 Complex currently operates 33 emission sources included in this application to continue permitting under the TDEC operating permit program. A brief description of the emission sources is given below. Several sources were shut down during the term of the current operating permit and will not be included in this permit application. Section 6.0 highlights permit changes or pending permit changes since the initial major source operating permit was issued October 2004.

BUILDING 9201-1 - GENERAL MACHINE SHOPS [EMISSION SOURCE REFERENCE NUMBERS (ESRNs) 01-0020-17, 01-0020-59, 01-0020-15]

Building 9201-1 is a complete machine shop facility used to perform large and small machining operations; cutting; welding; forming of special components and individual items; and the assembly, testing, and packaging of the completed product. Some of these operations are conducted in enclosed shops and open work areas. Microsol 165 Solution (Trim Sol Machine Coolant) is circulated through a clean-up system and returned to the machine coolant system for re-use. Uranium is not handled in Building 9201-1.

This building is divided into several shop areas. Operations performed in each of these shops are very similar. The shops utilize various lathe, drilling, and cutting machines. Some machine shops are exempt from air permitting requirements

BUILDING 9201-1 WEST - GENERAL MACHINE SHOP (ESRN 01-0020-99)

This emission source consists of sand/grit blasting, painting, and parts cleaning. This shop also consists of welding and machining (small scale) which is exempt from air permitting requirements per Chapter 1200-3-9-.04. The shop also may machine different materials such as iron, aluminum, and brass.

BUILDING 9401-3 -Y-12 STEAM PLANT (ESRN 01-1020-31,-32,-34)

The Y-12 Steam Plant consists of three boiler units fired either by coal or natural gas. Each boiler has a capacity of approximately 250,000 pounds per hour of steam. A coal pile and coal handling system are also part of the steam plant. The coal handling system consists of a hopper feeder, crusher, and conveyor belts. Each boiler is equipped with two (2) pulverizing mills. The flue gas from each boiler is ducted through an air preheater. Flue gas then passes through a reverse air baghouse.

Steam is produced by the heat from the combustion of fuel and the flow of hot gases across water-filled tubes in the boiler. The combustion process converts fuel to heat energy to change the boiler water to steam.

BUILDINGS 9767-4 AND 9767-13 - BRINE/METHANOL SYSTEMS (ESRNs 01-0020-38, 01-0020-35)

These buildings are known as the chiller system. The brine/methanol system is a make-up system of 24 percent methanol and 76 percent water. The system is replenished with brine/methanol each year.

BUILDING 9811-6 - DRY ASH HANDLING SYSTEM (ESRN 01-1020-82)

The system consists of a mechanical vacuum system with two identical vacuum blowers that remove fly ash from the steam plant baghouses and furnace hoppers and collect it in an ash storage silo.

BUILDING 9201-5N/5W - PRODUCTION MACHINING OPERATIONS AND PLATING OPERATIONS (ESRNs 01-1020-18/01-0020-21, 01-0020-30)

The primary mission of the Building 9201-5N Production Machining Operations is to process depleted uranium (DU) metal and alloy and nonuranium metals such as steel, aluminum alloys, cast iron, magnesium alloys, and bronze. The principal processes are metal-working operations in which a cast, forged, or formed shape is machined. The processes performed in the operations are standard industrial operations such as milling, sawing, wire-feed electrical discharge, single-point turning, lapping, grinding, and boring. The operations contain computer-controlled and manually operated machine tools of various sizes and descriptions. The machining operations can perform blank machining, semimachining, finish machining, auxiliary feature generation, material properties sample collection, and specimen preparation.

The primary mission of the Building 9201-5W Production Machining Operations is also used to process DU metal and alloy and nonuranium metals on a smaller scale than the Building 9201-5N Production Machining Operations. However, limited machining operations in the Building 9201-5W Production Machining Operations support the Building 9201-5N Production Machining Operations.

The primary process in the Ion Plating Operation is to plate various metals onto different substrates (including DU). Major equipment in the area includes vacuum vessels, vacuum pumps, high-voltage direct current (dc) rectifiers, ultrasonic cleaners, and grit blasters.

The precious metals plating area contains equipment for precious metals plating applications, including cyanide plating baths, low-voltage dc rectifiers, ultrasonic cleaners, and other support equipment. The precious metals recovery area uses various methods to process precious metal materials that have no radioactive contamination. The primary processes include digestion, denitration, precipitation, electroplating, and cleaning. Major equipment includes tanks, rectifiers, and induction furnaces. The primary process in the cyanide destruction area is to decompose cyanide solutions generated by the plating operations.

Equipment for nickel plating exists in Building 9201-5N, but operations have not begun at this time. The primary process in this area is plating electrolytic nickel onto DU.

BUILDING 9202 - DEVELOPMENT ACTIVITIES (ESRN 01-0020-06)

The Y-12 Development Organization operates literally hundreds of processes in a research and development (R&D) environment. The organization facilities are utilized to perform R&D activities in support of the overall DOE missions. These activities encompass diverse technical disciplines and many different laboratories and pilot plant scale operations and experimental techniques. These include studies of metals and ceramics, synthesis of organic compounds, microanalysis, use of robotics, measurement technique studies, computer software development, development of electronic devices, precision machining, methods for waste treatment and process material recovery, as well as the development of fabrication processes. Work is typically performed in laboratory hoods or inert atmosphere glove boxes. Most development activities are exempt from air permitting requirements per TDEC Chapter 1200-3-9-.04(5). There is only one permitted emission source in Building 9202.

BUILDINGS 9215 AND 9998 COMPLEX - URANIUM PROCESSES (ESRNs 01-0020-13, 01-0020-37, 01-1020-51, 01-1020-52, 01-1020-53, 01-1020-84, 01-1020-12)

Buildings 9215 and 9998 are referred to as the Building 9215 Complex. The Building 9215 Complex currently provides storage and handling of enriched uranium inventories; aids in the dismantlement of weapons; provides fabricated metal shapes as needed for weapon stockpile maintenance; and supports nuclear energy programs at other U.S. and foreign facilities. Operations in both buildings include the handling, packaging, and transport of uranium materials and parts in support of the activities within the process areas.

A new metal forming and heat treating process has recently completed construction but is not yet operational. This process includes a metal press, forming equipment, heating furnaces, salt bath, and a quench tank. The metals processed are depleted uranium metals and alloys.

BUILDING 9204-2 - LITHIUM PROCESS (ESRNs 01-0020-71, 01-1020-57, 01-1020-55, 01-1020-79, 01-0020-23)

The lithium processes and activities include wet chemistry, salvage, parts production, inspection, lithium metal production, powder production, machining, and a tank farm. Some lithium processes are exempt from air permitting requirements.

The wet chemistry process recovers lithium compounds from weapon components and pressed machine dust and purifies the material for reuse. The process involves basic chemical processing industry equipment used to convert lithium hydride or lithium deuteride to lithium hydroxide, convert the lithium hydroxide to lithium chloride, remove process water from the lithium chloride, and package the dry lithium chloride for storage. The wet chemistry process includes three systems: dissolution, neutralization, and evaporation and crystallization.

The lithium metal production process involves standard industry electrolytic cell equipment used to convert lithium chloride to lithium metal. The materials used in the process are recycled, except for the spent electrolysis anodes.

The powder production process has several flow path options. The purest product is formed by hydriding lithium metal (with hydrogen or deuterium). Prior to hydriding, metal that has been stored in mineral oil is cleaned with Solvent 140.

The part production process transforms powder from the crusher grinder operations or the powder-blending operation into solid part blanks that can be machined into final parts.

For the machining process, material handlers move parts to and from the machines and storage. Parts are loaded into the machines through air locks. Rough part blanks from part forming are machined into finished part shapes in the machining process. Lithium compounds are machined inside glove boxes with an inert atmosphere to protect part quality and prevent machine dust fires.

The salvage process reclaims and processes lithium from other lithium processes.

The Building 9204-2 tank farm provides storage for sodium hydroxide, hydrochloric acid, lithium hydroxide, sodium hypochlorite, and process condensate.

The Rubber Shop, formerly in Building 9404-9, is in the process of being relocated to Building 9204-2. The role of the Rubber Shop is to produce rubber, foam, and plastic parts, as well as provide a variety of heat and/or chemical resistant coatings. These operations are performed primarily in support of the Y-12 Complex, but a considerable amount of work is done for the other DOE Oak Ridge Reservation (ORR) sites, as well as other subcontractors

BUILDING 9204-2E - ASSEMBLY, QUALITY, DISASSEMBLY (FORMERLY RECLAMATION), AND STORAGE (ESRN 01-1020-56)

The building is used for assembly, quality operations, disassembly, and storage of components in an environmentally controlled atmosphere. Assembly activities include piece part cleaning, manual assembly techniques, adhesive bonding, welding, backfilling, leak testing, machining, electrical testing, etching, painting, and packaging. Quality operations include nondestructive testing activities such as radiography, ultrasonic, and pressure and flows testing; and dimensional inspection activities such as manual testing with hard gages and open set up. The disassembly activities involve manual tear-down operations, material verification/accountability activities, standard and inert machining operations, cryogenics operations, and containerization of disassembled components for reclamation or disposal.

BUILDING 9206 - ENRICHED URANIUM (EU) RECOVERY PROCESS (ESRNs 01-0020-03, 01-1020-24)

Building 9206 was used to recover and purify uranium from parts, equipment, combustibles, and miscellaneous salvage materials containing EU. The processes included feed preparation, feed adjustment and purification, and reduction/conversion. In addition, Building 9206 operations included production of uranium-bearing combustibles, cleaning and calcining depleted uranium (DU) metal chips to obtain uranium oxide for commercial sale, production of lower enrichment

compounds, and production of uranium powder in various levels of enrichment. Currently, Building 9206 is not intended to support future operations. Plans are to continue surveillance and maintenance activities and complete the transfer of materials remaining in the building to Building 9212 for processing.

There is also a tank farm associated with the Building 9206 EU process. One, 8500-gallon tank consists of acidified aluminum nitrate; another 12,800-gallon tank consists of 50 percent nitric acid; and another 10,000-gallon tank consists of chemical wastewater.

BUILDING 9212 - ENRICHED URANIUM PROCESSES
(ESRNs 01-1020-72, 01-0020-02, 01-0020-05)

The Building 9212 Complex systems are designed to (1) process scrap materials containing EU, (2) recover the EU, (3) convert the recovered uranium into various forms for subsequent use or storage, and (4) prepare the scrap material for disposal in accordance with Nuclear Materials Control and Accountability guidelines. The EU recovered in these processes may be formed into parts or billets in the metal casting operations or into custom oxides in special processing.

The Building 9212 Complex processes highly enriched uranium (HEU) to produce uranium metal and oxide suitable for storage, reactor fuels, specialty compounds, or weapons components. The recovery and purification operations reprocess HEU-bearing scrap and waste into forms suitable for reuse or accountability of the HEU contained therein. The majority of this scrap and waste are generated by the Y-12 Complex's weapon production or disassembly operations and by the recovery processes themselves. Some scrap and waste is generated through nuclear materials production; additional scrap is received from other sites for recovery or for accountability of the HEU it contains. The nature of these HEU-bearing materials varies from combustible and noncombustible solids to aqueous and organic solutions. Concentrations of HEU vary in these materials from pure uranium compounds and alloys to trace quantities [parts-per-million (ppm) levels] in combustibles and solutions.

The recovery and purification process for HEU relies on the unique physical and chemical properties of uranium in a nitrate system. The approach to recovery and purification, therefore, consists of chemically changing HEU (contained in scrap and waste) into a nitrate solution through dissolution, leaching, and other processes, and using the chemical properties of uranium to concentrate, purify, extract, and finally convert the HEU into a pure, metallic form.

BUILDING 9212 - AIR BEARING OPERATIONS (ESRN 01-0020-21)

The air bearing shop is a rebuild/rework operation. Air bearings are used in many of the precision machine tools located throughout Y-12 Complex. The process for building/reworking air bearings involves the attachment of porous graphite pads to metal housings. The graphite acts as a conduit for air that supports machine spindle journals (or in the case of air bearing steadyrests, parts). These graphite pads come to the shop in the general size and shape to fit the housings and journals. Shop personnel adhere the pads to the housings and lap the pads to the journals. A very light coat of lacquer is applied to the surface of the pad to better control the flow of air.

BUILDING 9225-3 – SPECIAL MATERIALS FACILITY (ESRN 01-0020-27)

This emission source purifies material from recycled parts, machine dust, or vendor-supplied material. It consists of purification, crushing and dissolving, filtering, crystallizing, mold loading, mold unloading/crushing/grinding, and vapor recovery.

BUILDING 9401-5 - URANIUM CHIP OXIDATION FACILITY (ESRN 01-0020-UCOF)

This emission source thermally oxidizes low-assay uranium and alloys under controlled conditions to a stable uranium oxide.

BUILDING 9401-7 - REPLACEMENT STEAM PLANT (ESRN 01-0020-09)

This steam plant consists of four natural gas-fired boilers with low-NOx burners and flue gas recirculation. The boilers are rated at 99 MMBtu/hr heat input each. Secondary fuel for each boiler is #2 Fuel Oil.

Attachment 2 to Form V.2

The following activities are insignificant because of TDEC Rule 1200-3-9-.04(5)(a)4(iv) which states, "any emission unit with the potential to emit radionuclides which result in a dose to the most exposed member of the public of less than 0.1 millirem per year. Such emission unit must be listed in the permit application."

INSIGNIFICANT ACTIVITIES

Source Number	Description	Regulation
Y-9204-2-EX-K	Wet Chemistry Generator Vessels	1200-3-9-.04(5)(a)4(iv)
Y-9204-2E-EX-D	Dismantlement/Disassembly Operation; Linear and Octagonal Glove Boxes	1200-3-9-.04(5)(a)4(iv)
Y-9204-2E-EX-B	Manual Metal Cutting Glove Box	1200-3-9-.04(5)(a)4(iv)
Y-9204-4-EX-B	Quality Evaluation Operation	1200-3-9-.04(5)(a)4(iv)
Y-9206-EX-K	Hood 34 Operation	1200-3-9-.04(5)(a)4(iv)
Y-9212-A2-EX-P	Grit/Sand Blaster	1200-3-9-.04(5)(a)4(iv)
Y-9212-EX-K	Welding Box (Glove Box)	1200-3-9-.04(5)(a)4(iv)
Y-9212-EX-N	Abrasive Saw	1200-3-9-.04(5)(a)4(iv)
Y-9215-EX-L	Rolling Mill	1200-3-9-.04(5)(a)4(iv)
Y-9215-EX-M	Hydroform Exhaust	1200-3-9-.04(5)(a)4(iv)
Y-9422-22-EX-C	EEVOC Plume Treatment/Air Stripper	1200-3-9-.04(5)(a)4(iv)
Y-9616-7-EX-B	WETF Degassifier Unit	1200-3-9-.04(5)(a)4(iv)
Y-9720-5-EX-B	Packing and Sampling Glove Box	1200-3-9-.04(5)(a)4(iv)
Y-9805-1-EX-A	Deuterium Gas Production Process	1200-3-9-.04(5)(a)4(iv)
Y-9998-EX-G3	G3 Machine Shop	1200-3-9-.04(5)(a)4(iv)

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
EMISSION SUMMARY FOR THE FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION

1. FACILITY NAME:

   U.S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.

AIR POLLUTANT	SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS		SUMMARY OF ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 4, APC V.28)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 4, APC V.28)
PARTICULATES (TSP)	210.87		39	
SULFUR DIOXIDE	0.44		1,835	
VOLATILE ORGANIC COMPOUNDS	52.65		3.41	
CARBON MONOXIDE	N/A		19	
LEAD	<2		<1	
NITROGEN OXIDES	188.15		574	
TOTAL REDUCED SULFUR	N/A		N/A	
MERCURY	<1		<1	
ASBESTOS	N/A		N/A	
BERYLLIUM	<1		<1	
VINYL CHLORIDES	N/A		N/A	
FLUORIDES	N/A		N/A	
GASEOUS FLUORIDES	CLASSIFIED		4*	
RADIONUCLIDES	DOE Oak Ridge Reservation <10 mrem/yr		N/A	
PARTICULATE HAPS	<8.0		<1	
VOC HAPS	12.9		30.87	

(CONTINUED ON NEXT PAGE)

(CONTINUED FROM PREVIOUS PAGE)

3. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT (S) AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.

AIR POLLUTANT & CAS	SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS		SUMMARY OF ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 5, APC V.28)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 5, APC V.28)
GASEOUS HAPS	3.35		N/A	
NON-VOC GASEOUS HAPS	12.0		34	
FUGITIVE PM	102.7		28	
FUGITIVE VOC	5		N/A	
OTHERS	18.88		N/A	

4. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION

1. FACILITY NAME:
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. LIST ALL THE PROCESS EMISSION SOURCE (S) OR FUEL BURNING INSTALLATION (S) OR INCINERATOR (S) THAT ARE PART OF THIS APPLICATION.

See APC V.2

3. INDICATE THAT SOURCE (S) WHICH ARE CONTAINED IN THIS APPLICATION ARE PRESENTLY IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS, BY CHECKING THE FOLLOWING:

__X__ A. ATTACHED IS A STATEMENT OF IDENTIFICATION OF THE SOURCE (S) CURRENTLY IN COMPLIANCE. WE WILL CONTINUE TO OPERATE AND MAINTAIN THE SOURCE (S) TO ASSURE COMPLIANCE WITH ALL THE APPLICABLE REQUIREMENTS FOR THE DURATION OF THE PERMIT.

_____ B APC V 30 FORM (S) INCLUDES NEW REQUIREMENTS THAT APPLY OR WILL APPLY TO THE SOURCE (S) DURING THE TERM OF THE PERMIT. WE WILL MEET SUCH REQUIREMENTS ON A TIMELY BASIS.:

4. INDICATE THAT THERE ARE SOURCE (S) THAT ARE CONTAINED IN THIS APPLICATION WHICH ARE NOT PRESENTLY IN FULL COMPLIANCE, BY CHECKING BOTH OF THE FOLLOWING:

__N/A__ A. ATTACHED IS A STATEMENT OF IDENTIFICATION OF THE SOURCE (S) NOT IN COMPLIANCE, NON - COMPLYING REQUIREMENT (S), BRIEF DESCRIPTION OF THE PROBLEM, AND THE PROPOSED SOLUTION.

__N/A__ B. WE WILL ACHIEVE COMPLIANCE ACCORDING TO THE FOLLOWING SCHEDULE:

ACTION	DEADLINE

PROGRESS REPORTS WILL BE SUBMITTED:

START DATE: _____N/A_____ AND EVERY 180 DAYS THEREAFTER UNTIL COMPLIANCE IS ACHIEVED.

5. STATE THE COMPLIANCE STATUS WITH ANY APPLICABLE ENHANCED MONITORING AND COMPLIANCE CERTIFICATION REQUIREMENTS THAT HAVE BEEN PROMULGATED UNDER SECTION 114 (a) (3) OF THE CLEAN AIR ACT AS OF THE DATE OF SUBMITTAL OF THIS APC FORM V.31.

Initial Compliance Assurance Monitoring Plan for Y-12 Steam Plant submitted with this application.

6. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
APPLICATION COMPLETENESS CHECK LIST

I. IDENTIFICATION INFORMATION	___X__ COMPLETE	_____ INCOMPLETE	_____ NOT APPLICABLE
A. FACILITY INFORMATION			
FACILITY NAME, LOCATION & MAILING ADDRESS	__X___ YES	_____ NO	
PERMIT CONTACT PERSON	__X___ YES	_____ NO	
RESPONSIBLE OFFICIAL	__X___ YES	_____ NO	
PERMIT REQUESTED	__X___ YES	_____ NO	
B. SOURCE DESCRIPTION			
1. OPERATIONAL INFORMATION:			
SIC CODE(S)	__X___ YES	_____ NO	
LISTING AND DESCRIPTION OF EMISSION SOURCE(S)	__X___ YES	_____ NO	
2. IDENTIFICATION AND DESCRIPTION OF ALTERNATIVE OPERATIVE SCENARIOS (IF APPLICABLE)	_____ YES	_____ NO	__X___ N/A
C. PERMIT SHIELD REQUESTED	__X___ YES	_____ NO	
II. EMISSIONS INFORMATION	_X___ COMPLETE	_____ INCOMPLETE	_____ NOT APPLICABLE
A. QUANTIFICATION OF ALL EMISSIONS OF REGULATED AIR POLLUTANTS	__X___ YES	_____ NO	
B. EMISSION SOURCES:			
IDENTIFICATION AND DESCRIPTION OF ALL EMISSION SOURCES IN SUFFICIENT DETAIL TO ESTABLISH THE BASIS FOR FEES AND APPLICABILITY OF REQUIREMENTS	__X___ YES	_____ NO	
A LIST OF INSIGNIFICANT EMISSIONS UNITS OR ACTIVITIES EXEMPTED BECAUSE OF SIZE OR PRODUCTION RATE	__X___ YES	_____ NO	_____ N/A
C. PROCESS INFORMATION TO THE EXTENT IT IS NEEDED TO DETERMINE OR REGULATE EMISSIONS:			
FUELS	__X__ YES	_____ NO	_____ N/A
RAW MATERIAL(S) / MATERIALS USED	__X___ YES	_____ NO	_____ N/A
PRODUCTION RATES	__X___ YES	_____ NO	_____ N/A
D. FOR REGULATED AIR POLLUTANTS, LIMITATIONS ON SOURCE OPERATIONS AFFECTING:			
EMISSIONS	__X___ YES	_____ NO	_____ N/A
ANY WORK PRACTICE STANDARDS	__X___ YES	_____ NO	_____ N/A
E. OTHER INFORMATION REQUIRED BY ANY APPLICABLE REQUIREMENTS FOR ALL REGULATED AIR POLLUTANTS SUCH AS:			
UTM COORDINATES OF EMISSION SOURCES	__X___ YES	_____ NO	_____ N/A
FLOW RATES	__X___ YES	_____ NO	_____ N/A
STACK PARAMETERS	__X___ YES	_____ NO	_____ N/A
F. CALCULATIONS ON WHICH EMISSIONS RELATED INFORMATION ARE BASED	__X___ YES	_____ NO	_____ N/A

MAJOR SOURCE OPERATING PERMIT APPLICATION - APPLICATION COMPLETENESS CHECK LIST

III. APPLICABILITY

__X__ COMPLETE _____ INCOMPLETE _____ NOT APPLICABLE

A. CITATION AND DESCRIPTION OF ALL APPLICABLE REQUIREMENTS	__X___ YES	_____ NO	
B. OTHER SPECIFIC INFORMATION THAT MAY BE NECESSARY TO IMPLEMENT AND ENFORCE OTHER APPLICABLE REQUIREMENTS OF RULE 1200-3-9-.02(11) OF THE TENNESSEE AIR POLLUTION CONTROL REGULATIONS OR TO DETERMINE THE APPLICABILITY OF REQUIREMENTS	__X___ YES	_____ NO	
C. AN EXPLANATION OF ANY PROPOSED EXEMPTIONS FROM OTHERWISE APPLICABLE REQUIREMENTS	__X___ YES	_____ NO	_____ N/A

IV. COMPLIANCE

__X___ COMPLETE _____ INCOMPLETE _____ NOT APPLICABLE

A. COMPLIANCE STATUS			
1. A DESCRIPTION OF THE COMPLIANCE STATUS OF THE SOURCE WITH RESPECT TO ALL APPLICABLE REQUIREMENTS	__X___ YES	_____ NO	
2. FOR APPLICABLE REQUIREMENTS WITH WHICH THE SOURCE IS IN COMPLIANCE, A STATEMENT THAT THE SOURCE WILL CONTINUE TO COMPLY WITH SUCH REQUIREMENTS	__X___ YES	_____ NO	
3. FOR APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM, A STATEMENT THAT THE SOURCE WILL MEET SUCH REQUIREMENTS ON A TIMELY BASIS	__X___ YES	_____ NO	_____ N/A
4. FOR REQUIREMENTS FOR WHICH THE SOURCE IS NOT IN COMPLIANCE AT THE TIME OF PERMIT ISSUANCE, A NARRATIVE DESCRIPTION OF HOW THE SOURCE WILL ACHIEVE COMPLIANCE WITH SUCH REQUIREMENTS	_____ YES	_____ NO	__X___ N/A
5. IDENTIFICATION AND DESCRIPTION OF AIR POLLUTION CONTROL EQUIPMENT AND COMPLIANCE MONITORING DEVICES OR ACTIVITIES	__X___ YES	_____ NO	
6. DESCRIPTION OF OR REFERENCE TO ANY APPLICABLE TEST METHOD FOR DETERMINING COMPLIANCE WITH EACH APPLICABLE REQUIREMENT	__X___ YES	_____ NO	

B. COMPLIANCE SCHEDULE

_____ COMPLETE _____ INCOMPLETE __X__ NOT APPLICABLE

1. A SCHEDULE OF COMPLIANCE FOR SOURCES THAT ARE NOT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS AT THE TIME OF PERMIT ISSUES	_____ YES	_____ NO	__X___ N/A
2. A SCHEDULE FOR SUBMISSION OF CERTIFIED PROGRESS REPORTS NO LESS FREQUENTLY THAN EVERY SIX MONTHS FOR SOURCES REQUIRED TO HAVE A SCHEDULE OF COMPLIANCE TO REMEDY A VIOLATION	_____ YES	_____ NO	__X___ N/A

C. COMPLIANCE CERTIFICATION

__X__ COMPLETE _____ INCOMPLETE _____ NOT APPLICABLE

1. CERTIFICATION OF COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY A RESPONSIBLE OFFICIAL	__X___ YES	_____ NO
2. A STATEMENT OF METHODS USED FOR DETERMINING COMPLIANCE, INCLUDING A DESCRIPTION OF MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS	__X___ YES	_____ NO
3. A SCHEDULE FOR SUBMISSION OF COMPLIANCE CERTIFICATIONS	__X___ YES	_____ NO
4. A STATEMENT INDICATING THE SOURCE'S COMPLIANCE STATUS WITH ANY APPLICABLE ENHANCED MONITORING AND COMPLIANCE CERTIFICATION REQUIREMENTS OF THE FEDERAL ACT	__X___ YES	_____ NO

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
MISCELLANEOUS PROCESSES

1. FACILITY NAME:	2. PROCESS IDENTIFICATION NUMBER:
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	Sitewide General Requirements

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Y-12 Complex sitewide general activities including fugitive and nontraditional point sources

IF EMISSIONS ARE CONTROLLED FOR COMPLIANCE, ATTACH THE APPROPRIATE AIR POLLUTION CONTROL SYSTEM FORM.

4. NORMAL OPERATING SCHEDULE:	5. YEAR OF CONSTRUCTION OR LAST MODIFICATION:
____24__ HRS/DAY ___7___ DAYS/WK ____365__ DAYS/YR	N/A

6. DESCRIBE THIS PROCESS (PLEASE ATTACH A FLOW DIAGRAM OF THIS PROCESS) AND CHECK ONE OF THE FOLLOWING:

_____ BATCH ___X_____ CONTINUOUS

7. LIST THE TYPES AND AMOUNTS OF RAW MATERIALS INPUT TO THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS)
N/A	N/A	N/A	N/A

8. LIST THE TYPES AND AMOUNTS OF PRIMARY PRODUCTS PRODUCED BY THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE AMOUNT PRODUCED (UNITS)	MAXIMUM AMOUNT PRODUCED (UNITS)
N/A			

9. PROCESS FUEL USAGE:

TYPE OF FUEL	MAX HEAT INPUT (10^6 BTU/HR)	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS
N/A			

10. LIST ANY SOLVENTS, CLEANERS, etc., ASSOCIATED WITH THIS PROCESS:

N/A

IF THE EMISSIONS AND/OR OPERATIONS OF THIS PROCESS ARE MONITORED FOR COMPLIANCE, PLEASE ATTACH THE APPROPRIATE COMPLIANCE DEMONSTRATION FORM.

11. DESCRIBE ANY FUGITIVE EMISSIONS ASSOCIATED WITH THIS PROCESS, SUCH AS OUTDOOR STORAGE PILES, OPEN CONVEYORS, OPEN AIR SAND BLASTING, MATERIAL HANDLING OPERATIONS, etc. (PLEASE ATTACH A SEPARATE SHEET IF NECESSARY) .

See Attachment to APC V.10

12. LOCATION OF THIS PROCESS EMISSION SOURCE IN UTM COORDINATES:

UTM VERTICAL: _____N/A_____ UTM HORIZONTAL: __N/A_____

13. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION **January 2009**

CN-1007 RDA 1298

Attachment APC V.10 (Y-12 Plant)
Typical Sources of Fugitive Emissions from the
U.S. Department of Energy Oak Ridge Y-12 National Security Complex

Fugitive and nontraditional point source emissions to the atmosphere are generated from various sources at the Y-12 Complex. Fugitive and nontraditional point source emissions result from activities and source types that result in no significant or unusual threat to the maintenance of air quality standards in the vicinity of the Y-12 Complex. The following information is intended to describe the general nature of the fugitive sources and to describe potential emissions from these sources. In general, quantification of potential emissions from these sources is extremely difficult; however, extensive environmental monitoring and reporting is done for the entire ORR and for each ORR entity, including the Y-12 Complex. The results of the monitoring data are published annually in the ORR Annual Site Environmental Report which is provided each year to the TDEC/DOE Oversight Division. The data, reviewed over several years, demonstrates that air emissions from all Y-12 Complex operations, both permitted point sources and any fugitive and nontraditional point source emissions covered by this permit application, do not exceed federal or state ambient air quality standards nor pose a threat to the public health.

The following list categorizes potentially significant sources of fugitive and nontraditional point source air emissions which could be subject to major source permitting:

STORAGE PILES

SOIL BORROW AREA

UNPAVED ROADS

EARTH-MOVING OPERATIONS

LANDFILL OPERATIONS

COAL YARD OPERATIONS

DEMOLITION ACTIVITIES (EXCLUDING ASBESTOS) AND OTHER CONSTRUCTION-RELATED ACTIVITIES

BUILDING AND EQUIPMENT MAINTENANCE

ROAD PAVING AND MAINTENANCE ACTIVITIES

PORTABLE SOLDERING AND WELDING EQUIPMENT

AIR CONDITIONING AND REFRIGERATION EQUIPMENT

MISCELLANEOUS SOLVENT CLEANING ACTIVITIES

MISCELLANEOUS STORAGE CONTAINERS AND STORAGE AREAS

OTHER MISCELLANEOUS SOURCES WITH POSSIBLE FUGITIVE EMISSIONS

A more detailed description of each of the above categories of emissions follows:

STORAGE PILES

The Y-12 Complex has bulk material stored in piles, open bins, and other open holding areas. Fugitive particulate emissions may result from the storage and use of these materials. The materials stored in large quantities include (1) rock, gravel, sand, salt, and urea for ice removal and (2) soil. Storage piles for soil, gravel, and rock are typically temporary due to their use in construction projects. The size and location of these piles are variable throughout the Y-12 Complex. Visible fugitive emissions from these storage piles are rare and have not violated applicable fugitive dust standards.

SOIL BORROW AREAS

Soil borrow areas are operated by the Y-12 Complex in conjunction with remediation and construction activities. Fugitive particulate emissions may result from these areas. Visible fugitive dust from these sites can be controlled in dry weather by use of water spray, and no violations of fugitive dust standards have occurred.

UNPAVED ROADS

Unpaved roads in and around the Y-12 Complex have not created any annoying problems concerning fugitive dust emissions. These gravel roads are utilized by members of the Security Department and by personnel collecting appropriate environmental data in areas surrounding the Y-12 Complex. In addition to watering, traffic controls (such as speed limits and traffic volume restrictions) help provide emission reductions in these areas.

EARTH-MOVING OPERATIONS

Construction activities utilizing earth-moving equipment are another source of fugitive dust emissions at the Y-12 Complex. These activities involve the movement of trucks and loading equipment during the transfer of materials, in the aggregate form, from the construction site to other locations throughout the Y-12 Complex. During worst case emission conditions, watering is the principal means for controlling dust emissions from these activities.

LANDFILL OPERATIONS

Waste management facilities at the Y-12 Complex dispose of solid wastes according to procedures that protect the health and safety of on-site personnel, the public, and the environment as well as minimize long-term liability. These landfill operations are permitted under TDEC solid waste regulations.

COAL YARD OPERATIONS

The coal yard at the Y-12 Complex is located immediately west of the Y-12 Steam Plant and has a capacity of approximately 100,000 tons of coal. Coal is procured two times a year, in the spring and again in the fall. The stoker grade coal used at the steam plant is relatively free of fines, due to the fact that it has been screened and washed. There have been no reports of excessive fugitive particulate emissions from this source. The coal yard is permitted under the Y-12 Steam Plant permit, and is included here for completeness.

DEMOLITION ACTIVITIES (EXCLUDING ASBESTOS) AND OTHER CONSTRUCTION-RELATED ACTIVITIES

Construction activities involved in the demolition and construction of buildings generate air contaminants from construction spoil, which include asphalt, lumber, brick, block, roofing materials, concrete, soil, rock, tile, and other similar materials. These activities are conducted throughout the Y-12 Complex in support of projects funded by the DOE. Asbestos demolition operations are conducted under the requirements of 1200-3-11.-02 of the TDEC Air Pollution Control Regulations.

BUILDING AND EQUIPMENT MAINTENANCE ACTIVITIES

Activities associated with the maintenance of buildings and equipment are located throughout the Y-12 Complex. Examples include, but are not limited to, caulking, painting, sandblasting, and applying pipe joint sealer. Tar used in reroofing and repairs is also a possible source of fugitive emissions.

ROAD PAVING AND MAINTENANCE ACTIVITIES

Materials used in the maintenance activities for roads and parking areas located throughout the Y-12 Complex are small contributors to fugitive volatile organic compound (VOC) emissions. Road maintenance activities include asphalt paving, stripping, and coating of roads and parking areas in and around the Y-12 Complex.

PORTABLE SOLDERING AND WELDING EQUIPMENT

Operations involving the soldering or welding of building materials and equipment are conducted as field maintenance in areas throughout the Y-12 Complex. These operations are not a significant source of fugitive emissions.

AIR CONDITIONING AND REFRIGERATION EQUIPMENT

The maintenance and operation of air conditioning and refrigeration equipment is a fugitive source resulting in Freon emissions. This equipment is located throughout the Y-12 Complex. Service and repair of air conditioning and refrigeration equipment is performed in accordance with the requirements of 40 CFR Part 82.

MISCELLANEOUS SOLVENT CLEANING ACTIVITIES

Spraying, brushing, flushing, wiping, and immersion are cold cleaning operations using organic solvents to remove grease, oils, wax, and soil. Major solvent usages are permitted under applicable source operating permits. However, many small operations of this type occur throughout the Y-12 Complex for experimental and maintenance activities. This fugitive permit is intended to apply where these small containers use 5 gallons or less of solvent.

MISCELLANEOUS STORAGE CONTAINERS AND STORAGE AREAS

These storage containers include, but are not limited to, tanks, polytanks, cabinets, or drums containing oils, solvents, cleaners, machine coolants, and other industrial chemicals or waste. The containers are retained in gravel or concrete storage areas (the areas vary from completely open to totally enclosed), warehouses, vaults, storage cabinets (not limited to but including flammable storage), or diked storage areas pending final disposition. Emissions from these containers are considered to be included in permits for sources actively using these materials or generating the waste. However, some storage containers and drums contain wastes from remediation activities and processes that are exempt from permitting. These storage containers and areas are addressed in this fugitive source permit application.

OTHER MISCELLANEOUS SOURCES WITH POSSIBLE FUGITIVE EMISSIONS

1. Ozone from high voltage lines.
2. Chlorine from potable water sources.
3. Gasoline service stations (excluding storage tanks) and automobile maintenance activities.
4. Chlorine from cooling towers.
5. Possible lead emission from the Y-12 Security Pistol Range.
6. Open-burning activities consisting of uncontaminated pallets, trees, and brushes.
7. Office supplies such as correction fluid, markers, and ink pens.
8. Floor cleaning, polishing, and other housekeeping activities associated with custodial duties.
9. Battery charging stations.
10. Compressed gas bottles.
11. Part marking - chem-etching, vibro etching.
12. Airbrushes - small, hand-held sprayers used to apply liquid color to illustrations. The airbrush paints used are aqueous solutions of nontoxic colorants, no metallic pigments are used.
13. Portable maintenance activities such as painting, caulking, sandblasting, and pipe joint sealers.
14. Portable welding and soldering equipment used for field maintenance and repair.

The above description of potential fugitive and nontraditional point source emission sources at the Y-12 Complex are not all inclusive of all possible sources. However, every effort has been made to identify and include in the above descriptions all known potential sources for fugitive and nontraditional point source emissions.

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DIVISION OF AIR POLLUTION CONTROL
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401 CHURCH STREET
NASHVILLE, TN 37243-1531

COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE

ALL SOURCES THAT ARE SUBJECT TO 1200-3-9-.02(11) OF TENNESSEE AIR POLLUTION CONTROL REGULATIONS ARE REQUIRED TO CERTIFY COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY INCLUDING A STATEMENT WITHIN THE PERMIT APPLICATION OF THE METHODS USED FOR DETERMINING COMPLIANCE. THIS STATEMENT MUST INCLUDE A DESCRIPTION OF THE MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS. IN ADDITION, THE APPLICATION MUST INCLUDE A SCHEDULE FOR COMPLIANCE CERTIFICATION SUBMITTALS DURING THE PERMIT TERM. THESE SUBMITTALS MUST BE NO LESS FREQUENT THAN ANNUALLY AND MAY NEED TO BE MORE FREQUENT IF SPECIFIED BY THE UNDERLYING APPLICABLE REQUIREMENT OR THE TECHNICAL SECRETARY.

1. FACILITY NAME:
   U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. PROCESS EMISSION SOURCE, FUEL BURNING INSTALLATION, OR INCINERATOR (IDENTIFY):
   All air emission sources located at the Y-12 Complex subject to generally applicable requirements of the Tennessee Air Pollution Control Regulations 1200-3.

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
   Y-12 Complex sitewide general requirements

4. THIS SOURCE AS DESCRIBED UNDER ITEM #2 OF THIS APPLICATION WILL USE THE FOLLOWING METHOD(S) FOR DETERMINING COMPLIANCE WITH APPLICABLE REQUIREMENTS (AND SPECIAL OPERATING CONDITIONS FROM AN EXISTING PERMIT). CHECK ALL THAT APPLY AND ATTACH THE APPROPRIATE FORM(S).

   _____ CONTINUOUS EMISSIONS MONITORING (CEM) - APC FORM V.20
   POLLUTANT(S): _____

   _____ EMISSION MONITORING USING PORTABLE MONITORS - APC FORM V.21
   POLLUTANT(S): _____

   _____ MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS - APC FORM V.22
   POLLUTANT(S): _____

   _____ MONITORING MAINTENANCE PROCEDURES - APC FORM V.23
   POLLUTANT(S): _____

   _____ STACK TESTING - APC FORM V.24
   POLLUTANT(S): _____

   _____ FUEL SAMPLING & ANALYSIS (FSA) - APC FORM V.25
   POLLUTANT(S): _____

   __X___ RECORDKEEPING - APC FORM V.26
   POLLUTANT(S): ___Particulate, CFC/HCFC, Asbestos _____

   __X__ OTHER (PLEASE DESCRIBE) - APC FORM V.27
   POLLUTANT(S): _____Particulate, VOC, Miscellaneous Gaseous and Particulate HAP_____

5. COMPLIANCE CERTIFICATION REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE.

   START DATE: _____Annual Report Schedule_____

   AND EVERY _____ DAYS THEREAFTER.

6. COMPLIANCE MONITORING REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE:

   START DATE: _____Annual Report Schedule_____

   AND EVERY _____ DAYS THEREAFTER.

7. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
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NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY RECORDKEEPING

RECORDKEEPING SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE RECORDED AND THE APPLICABLE REQUIREMENT IS ESTABLISHED

1. FACILITY NAME:
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Y-12 National Security Complex sitewide general requirements

3. EMISSION SOURCE (IDENTIFY):

Air emission sources located at the Y-12 Complex subject to generally applicable requirements for asbestos

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

Asbestos

5. MATERIAL OR PARAMETER BEING MONITORED AND RECORDED:

Training records, Notices of Intent, waste records

6. METHOD OF MONITORING AND RECORDING:

Records include written Notices of Intent to demolish or renovate, training records, waste shipment records.

7. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

As required.

8. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY RECORDKEEPING

RECORDKEEPING SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE RECORDED AND THE APPLICABLE REQUIREMENT IS ESTABLISHED

1. FACILITY NAME:	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	Y-12 National Security Complex sitewide general requirements

3. EMISSION SOURCE (IDENTIFY):

Activities located at the Y-12 Complex subject to generally applicable requirements for Stratospheric Ozone Protection

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

CFC/HCFC

5. MATERIAL OR PARAMETER BEING MONITORED AND RECORDED:

CFC/HCFC

6. METHOD OF MONITORING AND RECORDING:

Service and repair logs. Leak rate calculations. Recovery/Recycle equipment certifications. Technician certifications.

7. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

As required.

8. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

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MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY RECORDKEEPING

RECORDKEEPING SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE RECORDED AND THE APPLICABLE REQUIREMENT IS ESTABLISHED

1. FACILITY NAME:

   U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

   Y-12 Complex Sitewide General Requirements

3. EMISSION SOURCE (IDENTIFY):

   Air emission sources located at the Y-12 Complex subject to generally applicable particulate requirements of the Tennessee Air Pollution Control Regulations 1200-3.

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

   Particulate

5. MATERIAL OR PARAMETER BEING MONITORED AND RECORDED:

   Particulate

6. METHOD OF MONITORING AND RECORDING:

   Process emissions standards for particulates – TDEC Rule 1200-3-7-.02, .03, .04

   For radionuclide sources see streamlined alternate emission limit and the annual Radionuclide Emission Report. For non-radionuclide sources see individual source applications.

7. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

   As required.

8. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY OTHER METHOD(S)

1. FACILITY NAME: U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S): Y-12 Complex Sitewide General Requirements

3. EMISSION SOURCE (IDENTIFY):

Y-12 Complex sitewide fugitive and nontraditional point source emissions.

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

Particulates, VOCs, miscellaneous gaseous and particulate HAPS

5. DESCRIPTION OF THE METHOD OF MONITORING:

Emissions are less than ten tons per year, consequently, no visible emission evaluations are required in accordance with the TDEC opacity matrix.

6. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

None required.

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MAJOR SOURCE OPERATING PERMIT APPLICATION
EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

1. FACILITY NAME:

   U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

   Y-12 Complex Sitewide General Requirements

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR (IDENTIFY):

   This is only for sitewide general fugitive and non-traditonal point sources.

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
PARTICULATES (TSP)	N/A		N/A	
(FUGITIVE EMISSIONS)	5		N/A	
SULFUR DIOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VOLATILE ORGANIC COMPOUNDS	N/A		N/A	
(FUGITIVE EMISSIONS)	5		N/A	
CARBON MONOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
LEAD	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
NITROGEN OXIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
TOTAL REDUCED SULFUR	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
MERCURY	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

(CONTINUED ON NEXT PAGE)

(CONTINUED FROM LAST PAGE)

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
ASBESTOS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
BERYLLIUM	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VINYL CHLORIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
GASEOUS FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT (S). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT & CAS	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
Miscellaneous Gaseous HAPs*	1 *		N/A	
Miscellaneous Particulate HAPs*	1 *		N/A	

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MAJOR SOURCE OPERATING PERMIT APPLICATION
CURRENT EMISSIONS REQUIREMENTS AND STATUS

1. FACILITY NAME:	2. EMISSION SOURCE NUMBER
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	Y-12 Complex - Multiple ESRN 01-0020 and 01-1020

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

The Y-12 Complex is a large industrial site subject to the following generally applicable requirements shown mostly in Section D of Title V Permits.

4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT	5. POLLUTANT	6. APPLICABLE REQUIREMENT (S) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS	7. LIMITATION	8. MAXIMUM ACTUAL EMISSIONS	9. COMPLIANCE STATUS (IN/OUT)
	Visible Emissions	1200-3-5-.01(1), Permit condition D1	≤ 20%	≤ 20%	IN
	Non-process particulate	1200-3-6, Permit condition D3	See steam plant	See steam plant	IN
	Process gaseous	1200-3-7-.07(2), Permit condition D4	See Solvent 140	See Solvent 140	IN
	Process Particulate	1200-3-7, Permit condition D5	0.02 ≤ Particulate ≤ 0.25 gr/dscf or input rates by PWR tables	See multiple sources	IN
	Sulfur Dioxide	1200-3-14, Permit condition D6	See steam plant	See steam plant	IN
	Fugitive Dust	1200-3-8, Permit condition D7	Work Practices, ≤ 20%	≤ 20%	IN
	Open Burning	1200-3-4, Permit condition D8	Work Practices	N/A	IN
	Asbestos	1200-3-11-.02(d), Permit condition D9	Work Practices and Notifications	N/A	IN

10. OTHER APPLICABLE REQUIREMENTS (NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT)

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9TH FLOOR, L&C ANNEX
401 CHURCH STREET
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MAJOR SOURCE OPERATING PERMIT APPLICATION
CURRENT EMISSIONS REQUIREMENTS AND STATUS

1. FACILITY NAME:	2. EMISSION SOURCE NUMBER
U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	Y-12 Complex - Multiple ESRN 01-0020 and 01-1020

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

The Y-12 Complex is a large industrial site subject to the following generally applicable requirements shown mostly in Section D of Title V Permits.

4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT	5. POLLUTANT	6. APPLICABLE REQUIREMENT (S) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS	7. LIMITATION	8. MAXIMUM ACTUAL EMISSIONS	9. COMPLIANCE STATUS (IN/OUT)
	CFC/HCFC	40 CFR 82 Subparts B, C, D, E, F - Condition A19	Work Practices, Permit	N/A	IN
Gasoline Dispensing Station	VOC	40 CFR 80.22(j)	10 GPM flow rate from gasoline dispensing nozzle	N/A	IN
Gasoline Dispensing Station	VOC	1200-3-18-.24	Stage I Controls	N/A	IN

10. OTHER APPLICABLE REQUIREMENTS (NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT)

9. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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APC V.10

MAJOR SOURCE OPERATING PERMIT APPLICATION
MISCELLANEOUS PROCESSES

1. FACILITY NAME:

U.S. Department of Energy Y-12 National Security Complex

2. PROCESS IDENTIFICATION NUMBER:

Complex-wide radionuclide activities

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Complex-wide radionuclide activities

IF EMISSIONS ARE CONTROLLED FOR COMPLIANCE, ATTACH THE APPROPRIATE AIR POLLUTION CONTROL SYSTEM FORM.

4. NORMAL OPERATING SCHEDULE:

____24__ HRS/DAY ___7___ DAYS/WK ____365__ DAYS/YR

5. YEAR OF CONSTRUCTION OR LAST MODIFICATION:
N/A

6. DESCRIBE THIS PROCESS (PLEASE ATTACH A FLOW DIAGRAM OF THIS PROCESS) AND CHECK ONE OF THE FOLLOWING:

_____ BATCH ___X_____ CONTINUOUS

7. LIST THE TYPES AND AMOUNTS OF RAW MATERIALS INPUT TO THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS)
Radionuclides and Alloys	Multiple containers	N/A	See each specific source

8. LIST THE TYPES AND AMOUNTS OF PRIMARY PRODUCTS PRODUCED BY THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE AMOUNT PRODUCED (UNITS)	MAXIMUM AMOUNT PRODUCED (UNITS)
N/A			

9. PROCESS FUEL USAGE:

TYPE OF FUEL	MAX HEAT INPUT (10^6 BTU/HR)	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS
N/A			

10. LIST ANY SOLVENTS, CLEANERS, etc., ASSOCIATED WITH THIS PROCESS:

See complex-wide solvent 140 and source specific activilties

IF THE EMISSIONS AND/OR OPERATIONS OF THIS PROCESS ARE MONITORED FOR COMPLIANCE, PLEASE ATTACH THE APPROPRIATE COMPLIANCE DEMONSTRATION FORM.

11. DESCRIBE ANY FUGITIVE EMISSIONS ASSOCIATED WITH THIS PROCESS, SUCH AS OUTDOOR STORAGE PILES, OPEN CONVEYORS, OPEN AIR SAND BLASTING, MATERIAL HANDLING OPERATIONS, etc. (PLEASE ATTACH A SEPARATE SHEET IF NECESSARY) .

See complex-wide general requirements

12. LOCATION OF THIS PROCESS EMISSION SOURCE IN UTM COORDINATES:

UTM VERTICAL: _____N/A_____ UTM HORIZONTAL: __N/A_____

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COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE

ALL SOURCES THAT ARE SUBJECT TO 1200-3-9-.02(11) OF TENNESSEE AIR POLLUTION CONTROL REGULATIONS ARE REQUIRED TO CERTIFY COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY INCLUDING A STATEMENT WITHIN THE PERMIT APPLICATION OF THE METHODS USED FOR DETERMINING COMPLIANCE. THIS STATEMENT MUST INCLUDE A DESCRIPTION OF THE MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS. IN ADDITION, THE APPLICATION MUST INCLUDE A SCHEDULE FOR COMPLIANCE CERTIFICATION SUBMITTALS DURING THE PERMIT TERM. THESE SUBMITTALS MUST BE NO LESS FREQUENT THAN ANNUALLY AND MAY NEED TO BE MORE FREQUENT IF SPECIFIED BY THE UNDERLYING APPLICABLE REQUIREMENT OR THE TECHNICAL SECRETARY.

1. FACILITY NAME:
   U.S. Department Of Energy Y-12 National Security Complex

2. PROCESS EMISSION SOURCE, FUEL BURNING INSTALLATION, OR INCINERATOR (IDENTIFY):
   Processes which process materials subject to the radionuclide national emission standard for hazardous air pollutants

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
   Multiple

4. THIS SOURCE AS DESCRIBED UNDER ITEM #2 OF THIS APPLICATION WILL USE THE FOLLOWING METHOD(S) FOR DETERMINING COMPLIANCE WITH APPLICABLE REQUIREMENTS (AND SPECIAL OPERATING CONDITIONS FROM AN EXISTING PERMIT). CHECK ALL THAT APPLY AND ATTACH THE APPROPRIATE FORM(S).

   __X___ CONTINUOUS EMISSIONS MONITORING (CEM) - APC FORM V.20
   POLLUTANT(S):
   _____Radionuclides - 40 CFR 61.93(b)(4)_____

   _____ EMISSION MONITORING USING PORTABLE MONITORS - APC FORM V.21
   POLLUTANT(S):
   _____

   _____ MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS - APC FORM V.22
   POLLUTANT(S):
   _____

   _____ MONITORING MAINTENANCE PROCEDURES - APC FORM V.23
   POLLUTANT(S):
   _____

   _____ STACK TESTING - APC FORM V.24
   POLLUTANT(S):
   _____

   _____ FUEL SAMPLING & ANALYSIS (FSA) - APC FORM V.25
   POLLUTANT(S):
   _____

   _____ RECORDKEEPING - APC FORM V.26
   POLLUTANT(S):
   _____

   __X___ OTHER (PLEASE DESCRIBE) - APC FORM V.27
   POLLUTANT(S): Periodic confirmatory measurement for radionuclides as described in the NESHAP Compliance Plan for Airborne Radionuclides on the Oak Ridge Reservation. _____.

5. COMPLIANCE CERTIFICATION REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE.

   START DATE: _____Per Annual NESHAP and Title V report schedules_____
   AND EVERY _____ DAYS THEREAFTER.

6. COMPLIANCE MONITORING REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE:

   START DATE: _____Per Annual NESHAP and Title V report schedules_____
   AND EVERY _____ DAYS THEREAFTER.

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY CONTINUOUS EMISSIONS MONITORING

1. FACILITY NAME:

U.S. Department Of Energy Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Multiple - See attached list

3. PROCESS EMISSION SOURCE OR FUEL BURNING INSTALLATION OR INCINERATOR:
Processes which process materials subject to the radionuclide national emission

4. DESCRIPTION OF EQUIPMENT MONITORING POLLUTANT:
POLLUTANT BEING MONITORED:
_ Radionuclides _____

4A. NAME OF MANUFACTURER:

Nuclear Measurements Corporation

4B. MODEL NUMBER:
N/A

4C. INSTALLATION YEAR:

1987

4D. TYPE:

_____IN SITU ___X___EXTRACTIVE _____DILUTION _____OTHER (SPECIFY): _____

4E. DESCRIBE HOW THE MONITOR WORKS:
Automatic particulate sampler designed to collect samples isokinetically (assuming constant stack flow) on 47 mm diameter filters using a sample flow rate of 1 cfrm (+/- 10%) with a pressure differential of 0-0.5 atmosphere.

5. DESCRIPTION OF EQUIPMENT MONITORING DILUENT:

DILUENT BEING MONITORED:
_____N/A_____

5A. NAME OF MANUFACTURER:

5B. MODEL NUMBER:

5C. INSTALLATION YEAR:

5D. TYPE:

_____IN SITU _____EXTRACTIVE _____O_2 _____CO_2 _____OTHER (SPECIFY):_____

5E. DESCRIBE HOW THE MONITOR WORKS:

6. DESCRIPTION OF EQUIPMENT MONITORING FLOW:

AMOUNT OF FLOW (DSCFM):
_____N/A_____

6A. NAME OF MANUFACTURER:

6B. MODEL NUMBER:

6C. INSTALLATION YEAR:

6D. TYPE:

_____ DIFFERENTIAL PRESSURE _____ THERMAL _____OTHER (SPECIFY): _____

7. OPACITY (OR USE OF VISIBLE EMISSION EVALUATIONS IN LIEU OF OPACITY MONITORING):

7A. INDICATE WHICH IS USED.

_____ MONITOR _____ VISIBLE EMISSION EVALUATIONS*

* FOR "VISIBLE EMISSION EVALUATIONS" CHOICE, PROCEDURES WILL BE SPECIFIED AS A CONDITION IN THE SOURCE'S OPERATING PERMIT.

7B. OPACITY MONITOR (STATE THE NAME OF MANUFACTURER, MODEL NUMBER, AND YEAR OF INSTALLATION):

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9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY OTHER METHOD(S)

1. FACILITY NAME:	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
U.S. Department Of Energy Y-12 National Security Complex	Multiple - See attached list

3. EMISSION SOURCE (IDENTIFY):

Processes which process materials subject to the radionuclide national emission

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

Particulates - radionuclides

5. DESCRIPTION OF THE METHOD OF MONITORING:

The National Emisison Standard for Hazardous Air Pollutants (NESHAP) for Radionuclide Emissions from Department of Energy Facilities, 40 CFR Part 61, Subpart H, requires in paragraph 61.93(b)(4)(i) that periodic confirmatory measurements of the emissions from minor radionuclide points be conducted. A NESHAP Compliance Plan for Airborne Radionuclides on the Oak Ridge Reservation, approved by EPA and adopted by TDEC, describes the various ways that periodic confirmatory measurements will be made. Results of these measurements are reported annually in the Oak Ridge Reservation Radionuclide NESHAP Annual Emissions Report.

Additionally, the radionuclide emission data is used to show compliance with particulate emission standards in Chapter 1200-3-7 of the TDEC regulations as a streamlined alternate emission limit.

6. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

Annually

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

1. FACILITY NAME: U.S. Department Of Energy Y-12 National Security Complex	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S): Multiple - See attached list

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR (IDENTIFY):

Processes which process materials subject to the radionuclide national emission standard for hazardous air pollutants

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
PARTICULATES (TSP)	1.0		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
SULFUR DIOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VOLATILE ORGANIC COMPOUNDS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
CARBON MONOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
LEAD	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
NITROGEN OXIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
TOTAL REDUCED SULFUR	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
MERCURY	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

(CONTINUED ON NEXT PAGE)

(CONTINUED FROM LAST PAGE)

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
ASBESTOS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
BERYLLIUM	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VINYL CHLORIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
GASEOUS FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT (S). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT & CAS	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
Radionuclides*	1.0		N/A	

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
CURRENT EMISSIONS REQUIREMENTS AND STATUS

1. FACILITY NAME:	2. EMISSION SOURCE NUMBER
U.S. Department Of Energy Y-12 National Security Complex	Multiple - See attached list

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

Processes which process materials subject to the radionuclide national emission standard for hazardous air pollutants

4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT	5. POLLUTANT	6. APPLICABLE REQUIREMENT (S) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS	7. LIMITATION	8. MAXIMUM ACTUAL EMISSIONS	9. COMPLIANCE STATUS (IN/OUT)
	Radionuclides	40 CFR Part 61.92, Subpart H, 1200-3-11-.08	10 MREM/YR	2 MREM/YR	IN
	Radionuclides	40 CFR Part 61.93, Subpart H, 1200-3-11-.08	Emission Monitoring	N/A	IN
	Radionuclides	40 CFR Part 61.94, 40 CFR Part 61.95, Subpart H	Compliance reporting and recordkeeping requirements	N/A	IN
	Radionuclides	40 CFR Part 61.07. 61.08, AND 61.96, Subpart H, 1200-3-11-.08	Application Required	N/A	IN
See attached streamlined alternate emission limit	Particulates	1200-3-7.04(1) and Title V Permit 554701 Condition E3	2000 LBS/YR	< 15 LBS/YR	IN

10. OTHER APPLICABLE REQUIREMENTS (NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT)

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Streamlined Alternate Emission Limit for Y-12 Complex Enriched and Depleted Uranium Process Emission Units

For the Y-12 Complex process emission units listed at the end of this text, we continue to demonstrate compliance with particulate emission limitations by demonstrating compliance with more restrictive NESHAP limits for radionuclides. A streamlined alternate emission limitation of 2000 pounds per year is used for the total particulate emissions from all stacks from the Y-12 Complex emission units listed. The units listed are those emission units which process materials that are principally composed of enriched or depleted uranium. The streamlined limit is established in accordance with the process outlined in "White Paper Number 2 for Improved Implementation of the Part 70 Operating Permits Program" issued by the EPA on March 5, 1996.

Background

Comparison of Requirements: The listed emission units are regulated as particulate sources under the General Process Emission Standards in Chapter 1200-3-7. The limitation is an hourly emission limit for the entire process, which is derived from the hourly process input weight rate. A grain loading is derived based upon the allowable emission rate in pounds per hour and the stack flow rate. Allowable particulate emissions from the listed units are currently limited to a 0.02 gr./dscf, based on Chapter 1200-3-7-.04(1), which states ". . . particulate emissions shall not be required to be less than 0.02 grains per dry standard cubic foot of stack gases . . . unless a lesser concentration is found by the board to be necessary."

The listed units are also regulated as radionuclide emission sources under 1200-3-11-.08, Radionuclides. The emission standard for radionuclides is that the total annual emissions from all sources on the ORR [including the Y-12 Complex, Oak Ridge National Laboratory (ORNL) and the East Tennessee Technology Park] not cause a radiological dose in excess of 10 millirems per year, effective dose equivalent (EDE). The requirements of Chapter 1200-3-11-.08 also include continuous emission monitoring for major emission points with the potential to cause a dose above 0.1 millirems per year (EDE) and periodic confirmation of low emissions from minor emission points. A Quality Assurance Project Plan is also required. Details of how these requirements are met are described in the NESHAP Compliance Plan and the NESHAP Quality Assurance Project Plan which have been approved by EPA Region 4 personnel. When TDEC was delegated authority to enforce the NESHAP rule, prior agreements with EPA were adopted as stated in the rule. The NESHAP limit is related to an annual emission total from all radionuclide sources, supported by monitoring and quality assurance practices.

The two requirements amount to dual regulation because uranium compounds emitted from these operations are emitted in particulate form. Ancillary materials processed in these units are also emitted in much smaller quantities as particulate matter.

Determination of the most restrictive requirements: Three aspects of the applicable requirements were considered to determine the most stringent requirements and propose a set of streamlined requirements. The aspects considered were total allowable emissions, monitoring and recordkeeping requirements, and forming emission limits.

Use of the existing 0.02 gr./dscf limit leads to an unrealistically high particulate emission allowable for emission units which process materials that are principally composed of enriched or depleted uranium. More specifically, individual sources would have a particulate allowable expressed as several tons per year, and collectively, the allowable emissions for these sources would equate to several hundred tons per year. The actual emission rates of uranium particulate matter, which occur in grams per year quantities for each stack, are either measured by the continuous stack samplers or estimated using a technique approved in the NESHAP compliance plan. The emission rate of additional particulate matter emitted as a result of processing ancillary materials in these units is typically less than the uranium emission rate but is conservatively assumed to be equal to the uranium emissions. The particulate emissions of uranium allowed by the General Process Emission Standards would result in a dose above the 10 millirem per year (EDE) NESHAP standard. Therefore, the NESHAP standard is more restrictive in terms of allowable emissions.

The second factor considered was the monitoring and recordkeeping required under the two limits. The NESHAP requirements for continuous sampling of major emission points, use of approved estimating methods for minor emission points and use of an approved Quality Assurance Project Plan is more restrictive than the undefined requirements for proving compliance with the General Process Emission Standard.

A third factor considered in this request is the form of two standards. The process weight rate in pounds per hour is the basis in the General Process Emission Standard. The emission limit is in the form of a process-by-process hourly particulate emission rate or grain loading. The form of the NESHAP standard for radionuclides is an annual dose limit which is based on annual stack (and fugitive) emissions totaled for all emission points for the entire year. The General Process Emission Standard, which is based on a pound per hour limit, is more restrictive in form.

Streamlined requirements compliance: Y-12 radiological processes meet the particulate emission rate limits for the listed process by meeting the NESHAP requirements for radionuclides. The total emissions of radionuclides and ancillary particulate matter are orders of magnitude lower than allowable particulate emissions under the General Process Emission Standards. Stack sampling data illustrate that emissions on a stack-by-stack basis are also much less than the allowable emissions. Although the form of the NESHAP requirements is not as restrictive as the pounds per hour form of the general process standard, the actual emissions are so much smaller that the NESHAP standard is sufficiently protective. For purposes of paying emission fees, a complex-wide cap of one (1) ton per year for particulate emissions from uranium process areas is used. One ton is the minimum payment threshold under the rule. Compliance with this cap is demonstrated by reporting the mass of uranium emissions in the annual air emission report submitted for compliance with the NESHAP standard.

This streamlining results in more efficient implementation of the operating permit by allowing the use of the extensive sampling and reporting system which has been established for the NESHAP program for radionuclides.

National Nuclear Security Administration Radiological NESHAP Sources						
Y-9998-A	Y-9998-F	Y-9215-D	Y-9212-A	Y-9212-B	Y-9212-C	Y-9206-B
Y-9215-A	Y-9215-B	Y-9215-C	Y-9204-2E-A	Y-9401-5-A(109)		

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
MISCELLANEOUS PROCESSES

1. FACILITY NAME:

U.S. Department of Energy Y-12 National Security Complex

2. PROCESS IDENTIFICATION NUMBER:

Solvent 140 Sources

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Solvent 140 Sources

IF EMISSIONS ARE CONTROLLED FOR COMPLIANCE, ATTACH THE APPROPRIATE AIR POLLUTION CONTROL SYSTEM FORM.

4. NORMAL OPERATING SCHEDULE:

___24__ HRS/DAY ___7__ DAYS/WK __365_ DAYS/YR

5. YEAR OF CONSTRUCTION OR LAST MODIFICATION:

N/A

6. DESCRIBE THIS PROCESS (PLEASE ATTACH A FLOW DIAGRAM OF THIS PROCESS) AND CHECK ONE OF THE FOLLOWING:

___X____ BATCH _____ CONTINUOUS

7. LIST THE TYPES AND AMOUNTS OF RAW MATERIALS INPUT TO THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS)
Solvent 140	Drums and other containers	N/A	4 tons per year

8. LIST THE TYPES AND AMOUNTS OF PRIMARY PRODUCTS PRODUCED BY THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE AMOUNT PRODUCED (UNITS)	MAXIMUM AMOUNT PRODUCED (UNITS)
N/A			

9. PROCESS FUEL USAGE:

TYPE OF FUEL	MAX HEAT INPUT (10^6 BTU/HR)	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS
N/A			

10. LIST ANY SOLVENTS, CLEANERS, etc., ASSOCIATED WITH THIS PROCESS:

The process is the complex-wide use of Solvent 140

IF THE EMISSIONS AND/OR OPERATIONS OF THIS PROCESS ARE MONITORED FOR COMPLIANCE, PLEASE ATTACH THE APPROPRIATE COMPLIANCE DEMONSTRATION FORM.

11. DESCRIBE ANY FUGITIVE EMISSIONS ASSOCIATED WITH THIS PROCESS, SUCH AS OUTDOOR STORAGE PILES, OPEN CONVEYORS, OPEN AIR SAND BLASTING, MATERIAL HANDLING OPERATIONS, etc. (PLEASE ATTACH A SEPARATE SHEET IF NECESSARY) .

N/A

12. LOCATION OF THIS PROCESS EMISSION SOURCE IN UTM COORDINATES:

UTM VERTICAL: _____N/A_____ UTM HORIZONTAL:

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE

ALL SOURCES THAT ARE SUBJECT TO 1200-3-9-.02(11) OF TENNESSEE AIR POLLUTION CONTROL REGULATIONS ARE REQUIRED TO CERTIFY COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY INCLUDING A STATEMENT WITHIN THE PERMIT APPLICATION OF THE METHODS USED FOR DETERMINING COMPLIANCE. THIS STATEMENT MUST INCLUDE A DESCRIPTION OF THE MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS. IN ADDITION, THE APPLICATION MUST INCLUDE A SCHEDULE FOR COMPLIANCE CERTIFICATION SUBMITTALS DURING THE PERMIT TERM. THESE SUBMITTALS MUST BE NO LESS FREQUENT THAN ANNUALLY AND MAY NEED TO BE MORE FREQUENT IF SPECIFIED BY THE UNDERLYING APPLICABLE REQUIREMENT OR THE TECHNICAL SECRETARY.

1. FACILITY NAME:

   U.S. Department of Energy Y-12 National Security Complex

2. PROCESS EMISSION SOURCE, FUEL BURNING INSTALLATION, OR INCINERATOR (IDENTIFY):

   Solvent 140 Sources

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

   Solvent 140 Sources

4. THIS SOURCE AS DESCRIBED UNDER ITEM #2 OF THIS APPLICATION WILL USE THE FOLLOWING METHOD(S) FOR DETERMINING COMPLIANCE WITH APPLICABLE REQUIREMENTS (AND SPECIAL OPERATING CONDITIONS FROM AN EXISTING PERMIT). CHECK ALL THAT APPLY AND ATTACH THE APPROPRIATE FORM(S).

   _____ CONTINUOUS EMISSIONS MONITORING (CEM) - APC FORM V.20
   POLLUTANT(S): _____

   _____ EMISSION MONITORING USING PORTABLE MONITORS - APC FORM V.21
   POLLUTANT(S): _____

   _____ MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS - APC FORM V.22
   POLLUTANT(S): _____

   _____ MONITORING MAINTENANCE PROCEDURES - APC FORM V.23
   POLLUTANT(S): _____

   _____ STACK TESTING - APC FORM V.24
   POLLUTANT(S): _____

   _____ FUEL SAMPLING & ANALYSIS (FSA) - APC FORM V.25
   POLLUTANT(S): _____

   __X___ RECORDKEEPING - APC FORM V.26
   POLLUTANT(S): ____VOC - Solvent 140_____

   _____ OTHER (PLEASE DESCRIBE) - APC FORM V.27
   POLLUTANT(S):

5. COMPLIANCE CERTIFICATION REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE.

   START DATE: _____Title V Permit Annual Report Schedule_____

   AND EVERY _____ DAYS THEREAFTER.

6. COMPLIANCE MONITORING REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE:

   START DATE: _____ Title V Permit Annual Report Schedule _____

   AND EVERY _____ DAYS THEREAFTER.

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY RECORDKEEPING

RECORDKEEPING SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE RECORDED AND THE APPLICABLE REQUIREMENT IS ESTABLISHED

1. FACILITY NAME:

   U.S. Department of Energy Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

   Solvent 140 Sources

3. EMISSION SOURCE (IDENTIFY):

   Solvent 140 Sources

4. POLLUTANT(S) OR PARAMETER BEING MONITORED:

   VOC - Solvent 140

5. MATERIAL OR PARAMETER BEING MONITORED AND RECORDED:

   VOC - Solvent 140

6. METHOD OF MONITORING AND RECORDING:

   A total of the material issued for use during the previous calendar year as tracked in an automated tracking system.

7. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

   Once per year

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

1. FACILITY NAME: U.S. Department of Energy Y-12 National Security Complex	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S): Solvent 140 Sources

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR (IDENTIFY):

Solvent 140 Sources

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR-ITEM 8, APC V.30)
PARTICULATES (TSP)	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
SULFUR DIOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VOLATILE ORGANIC COMPOUNDS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		< 1.0	
CARBON MONOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
LEAD	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
NITROGEN OXIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
TOTAL REDUCED SULFUR	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
MERCURY	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

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AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
ASBESTOS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
BERYLLIUM	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VINYL CHLORIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
GASEOUS FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT (S). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT & CAS	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
N/A				

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
CURRENT EMISSIONS REQUIREMENTS AND STATUS

1. FACILITY NAME:	2. EMISSION SOURCE NUMBER
U.S. Department of Energy Y-12 National Security Complex	Solvent 140 Sources

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

Solvent 140 Sources

4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT	5. POLLUTANT	6. APPLICABLE REQUIREMENT (S) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS	7. LIMITATION	8. MAXIMUM ACTUAL EMISSIONS	9. COMPLIANCE STATUS (IN/OUT)
Complex-wide	VOC (Solvent 140)	1200-3-18-.02(2)	39 Tons/Yr	4.0 Tons/Yr	In

10. OTHER APPLICABLE REQUIREMENTS (NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT)

9. PAGE NUMBER: REVISION NUMBER: DATE OF REVISION:

Solvent 140 Emission Calculations

The actual emission calculations are based on the amount of Solvent 140 used in gal/yr. In calendar year 2007, less than 70 gallons of Solvent 140 were issued to buildings at the Y-12 Complex. It is assumed that all of the Solvent 140 issued is used and emitted to the atmosphere. Most of the Solvent 140 used at the complex may evaporate as fugitive emissions.

Given: Specific Gravity of Solvent 140 = 0.77
Density of water = 8.34 lb/gal

A. Actual Volatile Organic Compound (VOC) Emissions

$$\frac{70\ \text{gal}}{\text{yr}} \left| \frac{(0.77)8.34\ \text{lb}}{\text{gal}} \right| \frac{\text{ton}}{2{,}000\ \text{lb}} \Bigg| = \mathbf{0.22\ or\ minimum\ payment\ unit\ of\ 1.0\ ton\ VOC/yr}$$

Solvent 140 Emission Calculations

The actual maximum emission calculations are based on the amount of Solvent 140 used in gal/yr. During a theoretical maximum year, approximately 1200 gallons Solvent 140 are used. Most of the Solvent 140 used at the complex may evaporate as fugitive emissions.

Given: Specific Gravity of Solvent 140 = 0.77
Density of water = 8.34 lb/gal

A. Limitation

39 tons/yr - Permit Condition

B. Maximum Actual VOC Emissions

$$\frac{1200\ \text{gal}}{\text{yr}} \left| \frac{(0.77)8.34\ \text{lb}}{\text{gal}} \right| \frac{\text{ton}}{2{,}000\ \text{lb}} \Bigg| = 4\ \text{tons VOC/yr}$$

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
MISCELLANEOUS PROCESSES

1. FACILITY NAME:

U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. PROCESS IDENTIFICATION NUMBER:

Complex-wide Beryllium/Beryllium Compounds

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):
Complex-wide Beryllium/Beryllium Compounds

IF EMISSIONS ARE CONTROLLED FOR COMPLIANCE, ATTACH THE APPROPRIATE AIR POLLUTION CONTROL SYSTEM FORM.

4. NORMAL OPERATING SCHEDULE:

_10_ HRS/DAY _4_ DAYS/WK _208_ DAYS/YR

5. YEAR OF CONSTRUCTION OR LAST MODIFICATION:

N/A

6. DESCRIBE THIS PROCESS (PLEASE ATTACH A FLOW DIAGRAM OF THIS PROCESS) AND CHECK ONE OF THE FOLLOWING:

___X_____ BATCH _____ CONTINUOUS

These forms are for the machining/processing of beryllium/beryllium compounds for the entire Y-12 Complex. The complex-wide emission limit for beryllium emissions is 10 grams per 24 hours in accordance with Rule 1200-3-11-.03(3)(a)

7. LIST THE TYPES AND AMOUNTS OF RAW MATERIALS INPUT TO THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS)
Be/Be Compounds	Stored in drums or other containers	N/A	see each specific source

8. LIST THE TYPES AND AMOUNTS OF PRIMARY PRODUCTS PRODUCED BY THIS PROCESS:

MATERIAL	STORAGE/MATERIAL HANDLING PROCESS	AVERAGE AMOUNT PRODUCED (UNITS)	MAXIMUM AMOUNT PRODUCED (UNITS)
N/A			

9. PROCESS FUEL USAGE:

TYPE OF FUEL	MAX HEAT INPUT (10^6 BTU/HR)	AVERAGE USAGE (UNITS)	MAXIMUM USAGE (UNITS
N/A			

10. LIST ANY SOLVENTS, CLEANERS, etc., ASSOCIATED WITH THIS PROCESS:

N/A

IF THE EMISSIONS AND/OR OPERATIONS OF THIS PROCESS ARE MONITORED FOR COMPLIANCE, PLEASE ATTACH THE APPROPRIATE COMPLIANCE DEMONSTRATION FORM.

11. DESCRIBE ANY FUGITIVE EMISSIONS ASSOCIATED WITH THIS PROCESS, SUCH AS OUTDOOR STORAGE PILES, OPEN CONVEYORS, OPEN AIR SAND BLASTING, MATERIAL HANDLING OPERATIONS, etc. (PLEASE ATTACH A SEPARATE SHEET IF NECESSARY) .

N/A

12. LOCATION OF THIS PROCESS EMISSION SOURCE IN UTM COORDINATES:

UTM VERTICAL: _____N/A_____ UTM HORIZONTAL:

13. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
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COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE

ALL SOURCES THAT ARE SUBJECT TO 1200-3-9-.02(11) OF TENNESSEE AIR POLLUTION CONTROL REGULATIONS ARE REQUIRED TO CERTIFY COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY INCLUDING A STATEMENT WITHIN THE PERMIT APPLICATION OF THE METHODS USED FOR DETERMINING COMPLIANCE. THIS STATEMENT MUST INCLUDE A DESCRIPTION OF THE MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS. IN ADDITION, THE APPLICATION MUST INCLUDE A SCHEDULE FOR COMPLIANCE CERTIFICATION SUBMITTALS DURING THE PERMIT TERM. THESE SUBMITTALS MUST BE NO LESS FREQUENT THAN ANNUALLY AND MAY NEED TO BE MORE FREQUENT IF SPECIFIED BY THE UNDERLYING APPLICABLE REQUIREMENT OR THE TECHNICAL SECRETARY.

1. FACILITY NAME:

   U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. PROCESS EMISSION SOURCE, FUEL BURNING INSTALLATION, OR INCINERATOR (IDENTIFY):

   Complex-wide Beryllium/Beryllium Compounds

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

   Complex-wide Beryllium/Beryllium Compounds

4. THIS SOURCE AS DESCRIBED UNDER ITEM #2 OF THIS APPLICATION WILL USE THE FOLLOWING METHOD(S) FOR DETERMINING COMPLIANCE WITH APPLICABLE REQUIREMENTS (AND SPECIAL OPERATING CONDITIONS FROM AN EXISTING PERMIT). CHECK ALL THAT APPLY AND ATTACH THE APPROPRIATE FORM(S).

   _____ CONTINUOUS EMISSIONS MONITORING (CEM) - APC FORM V.20
   POLLUTANT(S): _____

   _____ EMISSION MONITORING USING PORTABLE MONITORS - APC FORM V.21
   POLLUTANT(S): _____

   __X__ MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS - APC FORM V.22
   POLLUTANT(S): Be/Be Compounds

   _____ MONITORING MAINTENANCE PROCEDURES - APC FORM V.23
   POLLUTANT(S): _____

   __X__ STACK TESTING - APC FORM V.24
   POLLUTANT(S): Be/Be Compounds

   _____ FUEL SAMPLING & ANALYSIS (FSA) - APC FORM V.25
   POLLUTANT(S): _____

   _____ RECORDKEEPING - APC FORM V.26
   POLLUTANT(S): _____

   _____ OTHER (PLEASE DESCRIBE) - APC FORM V.27
   POLLUTANT(S): _____

5. COMPLIANCE CERTIFICATION REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE.

   START DATE: _____Semi-annual Report Schedule_____

   AND EVERY _____ DAYS THEREAFTER.

6. COMPLIANCE MONITORING REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE:

   START DATE: _____ Semi-annual Report Schedule _____

   AND EVERY _____ DAYS THEREAFTER.

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
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MAJOR SOURCE OPERATING PERMIT APPLICATION - COMPLIANCE DEMONSTRATION BY MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS

THE MONITORING OF A CONTROL SYSTEM PARAMETER OR A PROCESS PARAMETER SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE AND THE EMISSION RATE OF A PARTICULAR POLLUTANT IS ESTABLISHED.

1. FACILITY NAME:

   U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S)

   Complex-wide Beryllium/Beryllium Compounds

3. EMISSION SOURCE:

   Complex-wide Beryllium/Beryllium Compounds

4. POLLUTANT (S) BEING MONITORED:

   Beryllium/Beryllium Compounds

5. DESCRIPTION OF THE METHOD OF MONITORING AND ESTABLISHMENT OF CORRELATION BETWEEN THE PARAMETER VALUE AND THE EMISSION RATE OF A PARTICULAR POLLUTANT:

   Monitoring of pressure drop across the final HEPA filter. The minimum pressure drop is 0.5 inches of water.

   Due allowance may be made for lower pressure drop readings resulting from the replacment of filters.

   Records of maintenance on the control device will be maintained.

6. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

   Pressure drop shall be recorded once daily when the source is in operation.

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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NASHVILLE, TN 37243-1531

MAJOR SOURCE OPERATING PERMIT APPLICATION
COMPLIANCE DEMONSTRATION BY STACK TESTING

THE PERFORMANCE OF AN APPROPRIATE EPA STACK TEST METHOD FOR DEMONSTRATING COMPLIANCE WITH AN EMISSION LIMITATION HAS ALWAYS BEEN ACCEPTABLE. EPA TEST METHODS CONTAIN QUALITY ASSURANCE PROCEDURES THAT SHALL BE STRICTLY ADHERED TO BY THE SOURCE.

1. FACILITY NAME:

U. S. Department of Energy, Oak Ridge Y-12 National Security Complex

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S):

Complex-wide Beryllium/Beryllium Compounds

3. EMISSION SOURCE (IDENTIFY):

Complex-wide Beryllium/Beryllium Compounds

4. POLLUTANT(S) BEING MONITORED:

Beryllium/Beryllium Compounds

5. TEST METHOD:

EPA's 40 CFR 61, Appendix B, Method 104 - Determination of Beryllium, from stationary sources. The test reports were transmitted to TDEC personnel on August 19, 1991. Test results were based on a 24-hour operating day

Emission Source	Stack#	Average Emission (grams/day)
Y-9202-A	160	< 4.0 X 10-1
Y9998-B	172 *	< 3.4 X 10-2

NOTE: * Currently this source is not in operation. The permittee shall notify TDEC prior to start-up.

6. COMPLIANCE DEMONSTRATION FREQUENCY (SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED):

One-time stack test previously completed. See APC V.22.

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DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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MAJOR SOURCE OPERATING PERMIT APPLICATION
EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

1. FACILITY NAME: U. S. Department of Energy, Oak Ridge Y-12 National Security Complex	2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION (S): Complex-wide Beryllium/Beryllium Compounds

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR (IDENTIFY):

Complex-wide Beryllium/Beryllium Compounds

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
PARTICULATES (TSP)	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
SULFUR DIOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VOLATILE ORGANIC COMPOUNDS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
CARBON MONOXIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
LEAD	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
NITROGEN OXIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
TOTAL REDUCED SULFUR	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
MERCURY	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

(CONTINUED ON NEXT PAGE)

(CONTINUED FROM LAST PAGE)

AIR POLLUTANT	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
ASBESTOS	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
BERYLLIUM	<1		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
VINYL CHLORIDE	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	
GASEOUS FLUORIDES	N/A		N/A	
(FUGITIVE EMISSIONS)	N/A		N/A	

5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT (S). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

AIR POLLUTANT & CAS	MAXIMUM ALLOWABLE EMISSIONS		ACTUAL EMISSIONS	
	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 7, APC V.30)	TONS PER YEAR	RESERVED FOR STATE USE (POUNDS PER HOUR- ITEM 8, APC V.30)
Beryllium 7440-41-7*	< 1 *		N/A	

6. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION **January 2009**

AIR POLLUTANTS - HAZARDOUS AIR POLLUTANT EMISSIONS

BERYLLIUM/BERYLLIUM COMPOUNDS PARTICULATE EMISSIONS (TONS/YR)

The calculations listed below for total Be particulates under maximum allowable emissions involve limiting the emissions to 10 g/24 hr as stated in Tennessee Air Pollution Control Regulations (TAPCR) 1200-3-11.03(3)(a). The process of machining Be/Be compounds is based on the maximum material removal rates for the machine shop. Control devices are not required by a standard and not used in the calculations to determine fees.

Maximum Allowable Be Emissions (ton/yr)

$$\frac{10\text{ g}}{24\text{ hr}}\left|\frac{\text{lb}}{454\text{ g}}\right|\frac{\text{ton}}{2{,}000\text{ lb}}\left|\frac{8{,}760\text{ hr}}{\text{yr}}\right| = 0.004\text{ ton Be/yr}$$

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
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MAJOR SOURCE OPERATING PERMIT APPLICATION
CURRENT EMISSIONS REQUIREMENTS AND STATUS

1. FACILITY NAME:	2. EMISSION SOURCE NUMBER
U.S. Department of Energy, Oak Ridge Y-12 National Security Complex	Complex-wide Beryllium/Beryllium Compounds

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

Complex-wide Beryllium/Beryllium Compounds

4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT	5. POLLUTANT	6. APPLICABLE REQUIREMENT (S) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS	7. LIMITATION	8. MAXIMUM ACTUAL EMISSIONS	9. COMPLIANCE STATUS (IN/OUT)
Complex-wide	Beryllium	1200-3-11-.03(3)(a)	10 grams/24 hr	<0.5 grams/24 hr	IN

10. OTHER APPLICABLE REQUIREMENTS (NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT)

N/A					

9. PAGE NUMBER: REVISION NUMBER: **Rev. 0** DATE OF REVISION: **January 2009**

APC V.30 MAJOR SOURCE OPERATING PERMIT APPLICATION - CURRENT EMISSIONS REQUIREMENTS AND STATUS, SITEWIDE
BE/BE COMPOUNDS EMISSIONS

A. Limitation

10 g/24 hr

B. Maximum Actual Be Emissions **(*Based on Compliance Test Results*)**

Total = < 0.5 g/24 hr

TENNESSEE AIR POLLUTION CONTROL DIVISION

ATTENTION: FEES SECTION

Facility Name: Department of Energy Oak Ridge Y-12 Complex

Company Number (from cover letter): 01-0020 and 01-1020

_____ I choose to have my facility pay its major source annual emission fee calculated on an **allowable emission** basis.

_____ I choose to have my facility pay its major source annual emission fee calculated on an **actual emission** basis.*

__X__ I choose to have my facility pay its major source annual emission fee calculated on a **mixture basis** of actual emission and allowable emissions. I have listed all source that I wish to be subject to actual based emission fees.*

*In narrative form, please provide the procedures you feel are reasonable to quantify your actual emissions. The procedure should be verifiable and replicable. We are asking for your help in this matter to determine what is reasonable. Please attach separate pages as needed with the facility name and file number on each page.

SEE ATTACHED

Theodore D. Sherry, Manager – NNSA Y-12 Site Office
Name of Responsible Official

Signature

4/17/09
Date

EMISSION SOURCES BASED ON ACTUAL EMISSIONS

Major source emission fees will be calculated based on allowable emissions for all sources except the following:

1. Y-9401-3-A,B(170) AND C,D(171) – Existing Steam Plant	(ESRN 01-1020-31,-32,-34)
2. Y-9767-13-A(00) AND Y-9767-4-B(00) - Brine/Methanol System	(ESRN 01-0020-35,01-0020-38)
3. Y-12 Complex Site-Wide Solvent 140	Entire Complex
4. Y-9401-7-A,B (1160) AND C,D (1161) – Replacement Steam Plant	(ESRN 01-0020-09)

1. Actual emissions from the existing Y-12 Steam Plant will be calculated based upon the fuel usage per year (coal and natural gas), fuel heat values (sulfur and ash content of coal), baghouse efficiency, maximum rated heat input capacity, and emission factors reported in U.S. EPA Publication AP-42.

2. Actual emissions from the Y-12 Complex Brine/Methanol System will be calculated based upon the amount of methanol used per year to replenish the system. It is assumed that all methanol added to the system is lost to the atmosphere, such as equipment leaks, valves.

3. Y-12 Complex Site-wide Solvent 140 usage will be calculated based upon the amount of Solvent 140 purchased per year. It is assumed that all the Solvent 140 issued is used and emitted to the atmosphere.

4. Actual emissions from the replacement steam plant will be calculated based upon the fuel usage per year (natural gas and fuel oil), fuel heat values, sulfur content of fuel oil, maximum rated heat input capacity, and emission factors reported in U.S. EPA Publication AP-42.

NOTE: Example calculations for actual emissions in accordance with these procedures are found in TDEC Form APC V.28 for each source, respectively.

Updated: 03/13/09

Y-12 Complex
TITLE V PERMIT 554701
PERMIT RENEWAL

ACTIONS FOR PERMIT RENEWAL

The following permit actions are to be addressed at the time of major source operating permit renewal:

Date of Request	Action
04/27/06	Operating Permit Application to add fuel station Stage 1 requirements
01/23/07	Administration request to combine Permit 554594 into this permit, Uranium Chip Oxidation Facility (See E43-X). See Volumes 3.1/3.2 of this application, Building 9401-5.
6/03/08	Operational Flexibility Changes and Notification of Changes to Emission Source Y-9404-9-C, Rubber Shop. See Volume 2 of this application, Building 9204-2.
06/9/08	CAIR Permit 861316 issued on this date as an attachment to be incorporated into the Title V permit at time of renewal. The current permit Attachment 2, NOx Budget, is no longer valid and is to be removed from the permit.
08/28/08	Significant Modification request to add replacement steam plant to the major source operating permit. See Volume 2 of this application, Building 9401-7.
4/09 Renewal Application	1) Volume 4.1/4.2, Source Y-9206-B – remove stack 17 2) Volume 2.0, Source Y-9201-1-A – eliminate ESPNs 582 and 584 3) Volume 3.1/3.2, Source Y-9202-A – proposed streamline alternate emission limit – see Form V.30 4) Volume 3.1/3.2, Source Y-9201-5W-I – Request permit hygiene to remove process emission standard because emission is a fugitive source instead of a point source – see Form V.30

Y-12 Complex
TITLE V PERMIT 554701
PERMIT RENEWAL

ACTIONS PENDING MINOR MODIFICATION #1

The following actions are the subject of Minor Modification #1 which is a permit action pending at the time the renewal application was prepared. A draft of Minor Modification #1 was provided to B&W Y-12 personnel for review in February 2009.

Date of Request	Action
06/14/06	Minor Modification request to add source – converting construction Permit 956248P to operating permit, Special Materials Facility (See E44-X)
05/16/07	Minor Modification request to remove source from permit, 9201-5E Machine Shop 01-0020-21 (See E19-X)
10/18/07	Minor Permit Modification request to remove maximum available control technology (MACT) conditions and Attachment 3, Steam Plant 01-1020-31 (See E12-X)
12/5/07	Minor Modification request to remove source from permit, Classified Paper Incinerator 01-1020-99 (See E14-X)
9/29/08	Minor Modification request to remove Arc Melt, Y-9201-5-G, 01-0020-44 and Metal Forming, Y-9204-4-A, 01-1020-56 from the Title V permit
3/12/09	E-mail request to Jabari Martin – Condition E12-5, The Compliance Method Citation: 1200-3-5-.03(5) should be 1200-3-5-.03(1).

Y-12 Complex
TITLE V PERMIT 554701
PERMIT RENEWAL

PRIOR REQUESTS NO LONGER NEEDING ACTION

The following actions are prior permit change requests which have been overcome by events and/or they are out of date and, therefore, no longer require any action.

Date of Request	Action
12/07/06	Steam Plant (Existing) MACT operating permit application and request to revise steam plant MACT conditions (See Note 1)
05/07/07	Steam Plant (Existing) MACT Extension Request (See Note 1)
05/16/07	Request to put Y-9201-5-G, 01-0020-44 on admin hold, Arc Melt, (See E18-X) (See Note 2)

Note 1 The MACT standard subsequently vacated July 30, 2007. Reference subsequent October 18, 2007, request subject to pending Minor Permit Modification Number 1.

Note 2 Reference subsequent September 29, 2008, request subject to pending Minor Permit Modification Number 1.

Updated: 3/11/09

TITLE V PERMIT 554701
CHANGE RECORD

Date	Action
10/21/04	Permit Issued
4/13/05	Condition E2(a)(1) corrected. Reference to E12–1 and E12-2 corrected to read E12-2 and E12-3 respectively.
5/13/05	Administration Amendment #1 - Michelle Reichert replaces Steven Liedle as Responsible Official
12/8/05	Minor Modification #1 – Condition E17-1 (DAHS) Compliance Method revised from 1.0 inch pressure drop to 0.3 inch pressure drop.
6/12/06	Significant Modification #1 - steam plant major maintenance project – addition of NSR avoidance emission limitations **Permit Modification Riders**: 1) Exception clause added to conditions with pressure drop requirements 2) Steam plant MACT requirements added 3) Compliance method for Steam Plant visible emissions revised to address issue regarding continuous opacity monitoring versus semiannual visible emission evaluation (VEE) readings. 4) Defense Programs changed to NNSA 5) TDEC changed Condition E2(a) – Semiannual reports now requiring identification of deviations **from all permit requirements**
6/19/06	A Administration Amendment #2 – Theodore Sherry replaces William Brumley as Responsible Official

Updated: 1/29/07

TITLE V PERMIT 554594
CHANGE RECORD

Date	Action
10/21/04	Permit Issued
12/14/05	Administrative Amendment #1 – Paul F. Clay (BJC) replaces Stephen F. McCracken (DOE-EM) as Responsible Official
3/1/05	Administrative Amendment #2 – William J. Brumley and Michelle M. Reichert replace Paul F. Clay (BJC) as Responsible Officials
6/19/06	Administrative Amendment #2 - Theodore Sherry replaces William Brumley as responsible official. No change to Michelle Reichert – remains as responsible official.

VISIBLE EMISSION EVALUATIONS
FOR TITLE V PERMIT RENEWAL

Building Number	Source Number	Stack Number	Method	Completion Date
9201-1	01-0020-15	582	TVEE-2	No Renewal - No longer in service
9201-1	01-0020-15	583	TVEE-2	11/4/2008
9201-1	01-0020-15	584	TVEE-2	No Renewal - No longer in service
9201-1	01-0020-17	278	TVEE-2	11/4/2008
9201-1	01-0020-17	279	TVEE-2	* TBD – Out of Service
9201-5E	01-0020-21	71	TVEE-2	No Renewal - No longer in service
9201-5N	01-1020-18	67	TVEE-2	11/5/2008
9201-5N	01-0020-30	239	TVEE-2	* TBD – Out of Service
9201-5N	01-0020-30	240	TVEE-2	** TBD – No operation during permit term
9201-5N	01-0020-30	241	TVEE-2	** TBD – No operation during permit term
9201-5N	01-0020-30	454	TVEE-2	** TBD – No operation during permit term
9202	01-0020-06	160	TVEE-2	* TBD – Out of Service
9204-4	01-1020-56	85	TVEE-2	No Renewal - No longer in service
9204-4	01-1020-56	86	TVEE-2	No Renewal - No longer in service
9204-4	01-1020-56	87	TVEE-2	No Renewal - No longer in service
9401-3	01-1020-31	170 W	EPA-9	12/3/08
9401-3	01-1020-31	171 E	EPA-9	2/5/2009
9212	01-0020-05	44	TVEE-2	11/19/2008
9212	01-0020-05	45	TVEE-2	11/19/2008
9212	01-0020-05	46	TVEE-2	11/19/2008
9212	01-0020-05	47	TVEE-2	11/19/2008
9212	01-0020-05	113	TVEE-2	11/19/2008
9212	01-0020-05	128	TVEE-2	11/19/2008
9212	01-1020-72	27	EPA-9	11/25/2008
9212	01-1020-72	28	EPA-9	11/25/2008
9212	01-1020-72	33	EPA-9	11/26/2008
9212	01-1020-72	40	EPA-9	11/26/2008
9212	01-1020-72	134	EPA-9	11/25/2008
9212	01-1020-72	432	EPA-9	*TBD – Out of Service

***** Note 1: These emission sources were out-of-service during the months prior to and including the application renewal period. Initial VEEs are included in this application. Subsequent VEEs prior to the renewal application could not be conducted.

****** Note 2: The equipment which exhausts to these emission points has not operated during the term of the permit (October 21, 2004, through permit renewal in April 2009). Visible emission readings will be taken when the source is placed in normal process operation.

VISIBLE EMISSION EVALUATIONS - NO READINGS REQUIRED

Condition	Source Number	Stack Number	Reason no Opacity Reading Required per Opacity Matrix Decision Tree
E10-3	01-0020-59	586	< 10 tons per year emissions
E11-5	01-0020-99	272	< 10 tons per year emissions
E13-3	01-1020-19	324-327	< 10 tons per year emissions
E14-4	01-1020-99	435	< 10 tons per year emissions
E15-2	01-0020-35	00	Fugitive emissions only
E16-2	01-0020-38	00	Fugitive emissions only
E17-2	01-1020-82	377,378	< 10 tons per year emissions
E18-6	01-0020-44	75,76,412,413*	< 10 tons per year emissions
E22-3	01-0020-21	00	Fugitive emissions only
E24-6	01-1020-56	88-95, 415-417*	< 10 tons per year emissions
E25-5	01-0020-13	60-62,64,813	< 10 tons per year emissions
E26-4	01-0020-37	3	< 10 tons per year emissions
E27-4	01-1020-51	1,4	< 10 tons per year emissions
E28-5	01-1020-52	6,7	< 10 tons per year emissions
E29-4	01-1020-53	9-12	< 10 tons per year emissions
E30-3	01-1020-84	172	< 10 tons per year emissions
E31-4	01-1020-12	143	< 10 tons per year emissions
E32-4	01-0020-03	13-15	< 10 tons per year emissions
E33-4	01-0020-21	1083	Colorless Pollutants
E34-6	01-0020-05	26,114,290	< 10 tons per year emissions
E35-5	01-0020-02	38,43,48,110	< 10 tons per year emissions
E36-6	01-1020-72	112,518	Colorless Pollutants
E37-3	01-1020-55	357,359,361,363,364	< 10 tons per year emissions
E38-3	01-1020-55	351,358,360,362	< 10 tons per year emissions
E39-3	01-1020-79	371,372	< 10 tons per year emissions
E40-4	01-0020-71	313,314,317,318	< 10 tons per year emissions
E41-3	01-1020-57	342,344-347,349,350	< 10 tons per year emissions
E42-4	01-0020-68	101	< 10 tons per year emissions
EXX-X	01-0020-27	1144	Colorless and < 10 tons per year emissions
EXX-X	01-0020	109	< 10 tons per year emissions
EXX-X	01-0020-09	1160,1161	Not Required

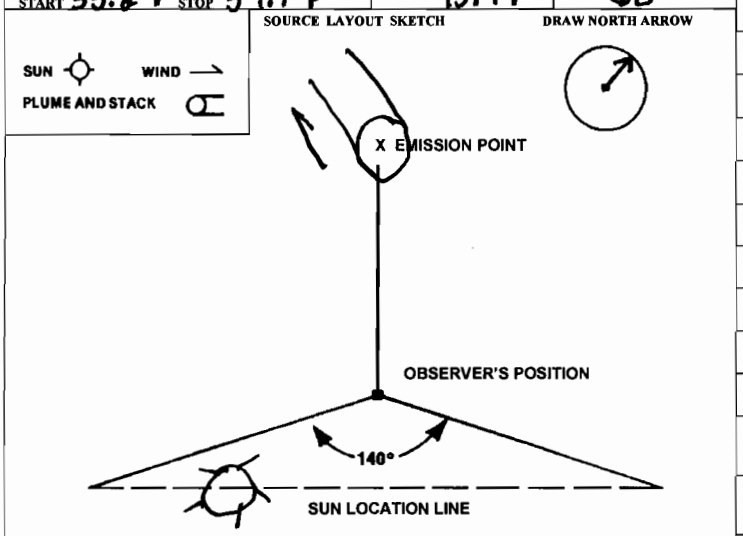
***** These emission points are no longer in service and have been removed from this renewal permit application.

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Metal Fab Grinding Area, Stack 583
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9201-1-A; 01-0020-15
PROCESS EQUIPMENT	Grinders and Belt Sanders
OPERATING MODE	In Service
CONTROL EQUIPMENT	None
OPERATING MODE	None
DESCRIBE EMISSION POINT	Rectangular (Square)
START	19" x 12" Smoke Stack
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	31'
HEIGHT ABOVE GROUND LEVEL STOP	31'
HEIGHT RELATIVE TO OBSERVER START	20'
HEIGHT RELATIVE TO OBSERVER STOP	20'
DISTANCE FROM OBSERVER START	40'
DISTANCE FROM OBSERVER STOP	40'
DIRECTION FROM OBSERVER START	SE
DIRECTION FROM OBSERVER STOP	SE
DESCRIBE VISIBLE EMISSIONS START	None
STOP	None
EMISSION COLOR START	None
STOP	None
IF WATER DROPLETT PLUME	N/A
ATTACHED ☐	DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	Vent obscured by building
STOP	same
BACKGROUND COLOR START	Clear Blue Sky
STOP	Same
SKY CONDITIONS START	Clear
STOP	Clear
WIND SPEED START	7.8 mph
WIND SPEED STOP	9.7 mph
WIND DIRECTION START	E
WIND DIRECTION STOP	E
AMBIENT TEMP. START	55.2°F
AMBIENT TEMP. STOP	59.7°F
WET BULB TEMP.	43.9°F
RH, percent	60

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/04/2008	0955	1025

MIN \ SEC	0	15	30	45	COMMENTS
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6	0	0	0	0	
7	0	0	0	0	
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20	0	0	0	0	
21	0	0	0	0	
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25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY

EPA METHOD 9 ☐ TVEE METHOD 2 √ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD 0

NUMBER OF READINGS ABOVE 20% WERE 0

OBSERVER'S NAME: Johnny Skinner

OBSERVER'S SIGNATURE: Johnny Skinner

DATE: 11/4/08

ORGANIZATION: ES&H – Clean Air Program

CERTIFICATION EXPIRATION DATE: April 12, 2009

VERIFIED BY: Stacy Jolley

DATE: 11/4/08

COMMENTS

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CN-0841 Original – File Canary – Facility RDA – 1298

DEPT. OF ENVIRONMENT & CONSERVATION

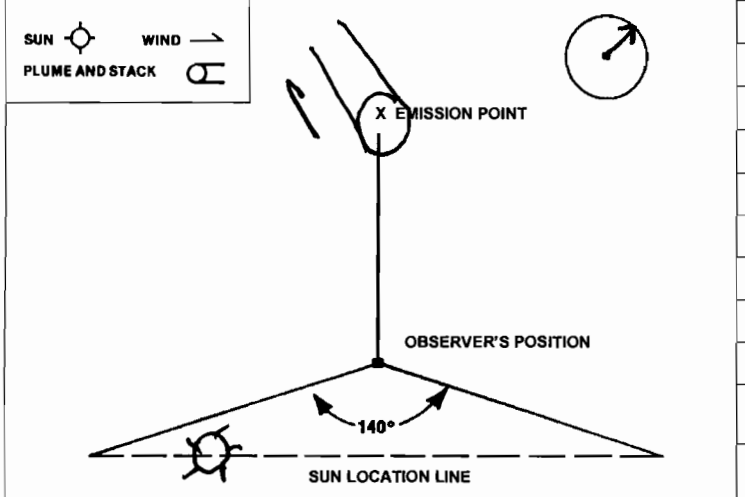
AIR POLLUTION CONTROL

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Graphite Machine Shop, Stack 278 – East Vent
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9201-1-C; 01-0020-17
PROCESS EQUIPMENT	Machining Equipment
OPERATING MODE	In Service
CONTROL EQUIPMENT	Panborn Dust Collector Baghouse
OPERATING MODE	Full
DESCRIBE EMISSION POINT	Rectangular (Square)
START	30" x 37" Stack Vent
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	12'
HEIGHT ABOVE GROUND LEVEL STOP	12'
HEIGHT RELATIVE TO OBSERVER START	12'
HEIGHT RELATIVE TO OBSERVER STOP	12'
DISTANCE FROM OBSERVER START	30'
DISTANCE FROM OBSERVER STOP	30'
DIRECTION FROM OBSERVER START	SE
DIRECTION FROM OBSERVER STOP	SE
DESCRIBE VISIBLE EMISSIONS START	None
STOP	None
EMISSION COLOR START	None
STOP	None
IF WATER DROPLETT PLUME	N/A
ATTACHED ☐	DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	Vent obscured by building
STOP	Same
BACKGROUND COLOR START	Clear Blue Sky
STOP	Same
SKY CONDITIONS START	Clear
STOP	Clear
WIND SPEED START	3.5 mph
STOP	3.5 mph
WIND DIRECTION START	E
STOP	E
AMBIENT TEMP. START	51.1 °F
STOP	55.2 °F
WET BULB TEMP.	42.6 °F
RH, percent	72.5

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/04/2008	0914	0944

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25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 ☐	TVEE METHOD 2 √
TVEE METHOD 1 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE 20% WERE	0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	11/4/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Stacy Jolley
DATE	11/4/08

COMMENTS

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TITLE

DATE

CN-0841

Original – File

Canary – Facility

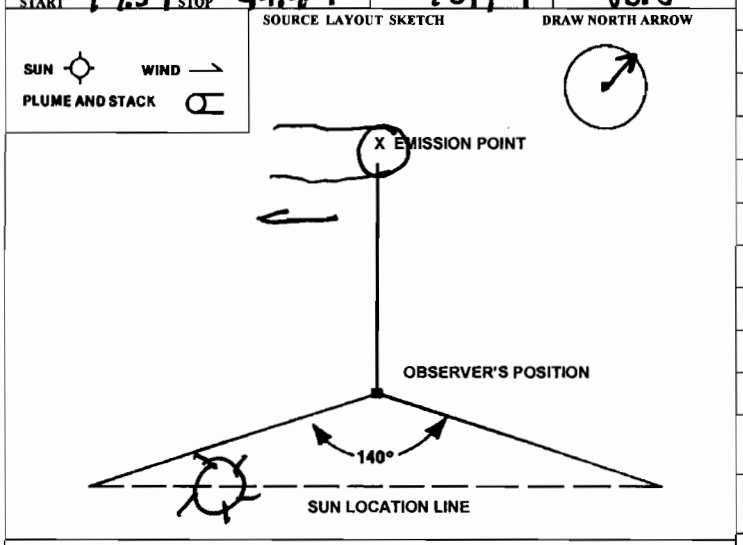
RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – North Machine Shop, Stack 67
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9201-5N-A; 01-1020-18
PROCESS EQUIPMENT	Machining Equipment
OPERATING MODE	Full
CONTROL EQUIPMENT	HEPA System
OPERATING MODE	Full
DESCRIBE EMISSION POINT	START Round 2.67' Diameter Stack STOP Same
HEIGHT ABOVE GROUND LEVEL	START 28.2' STOP 28.2'
HEIGHT RELATIVE TO OBSERVER	START 20' STOP 15'
DISTANCE FROM OBSERVER	START 100' STOP 50'
DIRECTION FROM OBSERVER	START SE STOP S
DESCRIBE VISIBLE EMISSIONS	START None STOP None
EMISSION COLOR	START None STOP None
IF WATER DROPLETT PLUME	N/A ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START Stack Exit STOP Stack Exit
DESCRIBE PLUME BACKGROUND	START Blue STOP Blue
BACKGROUND COLOR	START Blue Clear sky STOP Same
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 1.8 mph STOP 2 mph
WIND DIRECTION	START NE STOP NE
AMBIENT TEMP.	START 47.5°F STOP 49.4°F
WET BULB TEMP.	45.7°F
RH, percent	80.5

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/05/2008	0827	0857

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5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
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19	0	0	0	0	
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22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY — EPA METHOD 9 ☐ TVEE METHOD 1 ☐ TVEE METHOD 2 √ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD 0

NUMBER OF READINGS ABOVE 20% WERE 0

COMMENTS

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TITLE

DATE

OBSERVER'S NAME: Johnny Skinner

OBSERVER'S SIGNATURE: Johnny Skinner — DATE: 11/5/08

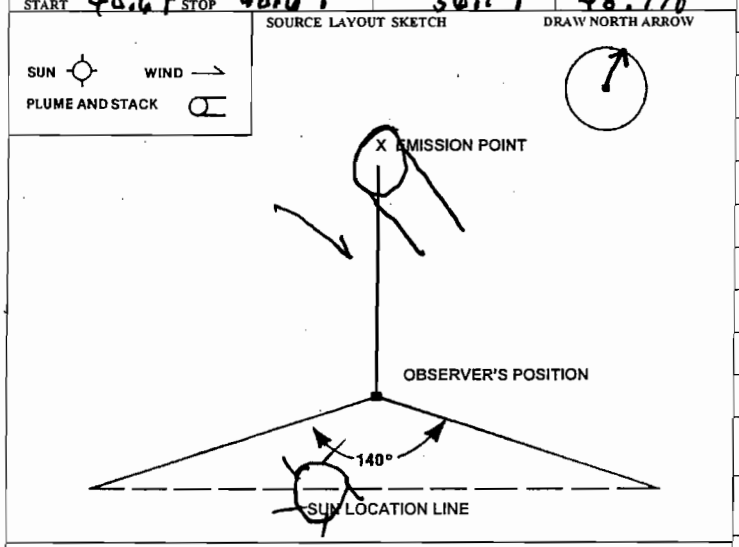
ORGANIZATION: ES&H – Clean Air Program — CERTIFICATION EXPIRATION DATE: April 12, 2009

VERIFIED BY: Marvin L. Shuffler — DATE: 11-5-08

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Chemical Processing/Recovering - Stack 27
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-A; 01-1020-72
PROCESS EQUIPMENT	O-Wing, Room 1010 Hoods, DDU's Beaker Leaching, Room 26
OPERATING MODE	In Service
CONTROL EQUIPMENT	HEPA Filter
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT START	Round 4.50' Diameter Stack
DESCRIBE EMISSION POINT STOP	Same
HEIGHT ABOVE GROUND LEVEL START	50.5'
HEIGHT ABOVE GROUND LEVEL STOP	Same
HEIGHT RELATIVE TO OBSERVER START	20'
HEIGHT RELATIVE TO OBSERVER STOP	20'
DISTANCE FROM OBSERVER START	30'
DISTANCE FROM OBSERVER STOP	30'
DIRECTION FROM OBSERVER START	SE
DIRECTION FROM OBSERVER STOP	SE
DESCRIBE VISIBLE EMISSIONS START	No Visible Emissions
DESCRIBE VISIBLE EMISSIONS STOP	observed
EMISSION COLOR START	Clear
EMISSION COLOR STOP	Same
IF WATER DROPLETT PLUME	N/A
ATTACHED ☐	DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	Partly Cloudy Sky
DESCRIBE PLUME BACKGROUND STOP	Slightly cloudy sky
BACKGROUND COLOR START	Partly Blue
BACKGROUND COLOR STOP	Slightly Blue
SKY CONDITIONS START	Slightly Cloudy
SKY CONDITIONS STOP	Same
WIND SPEED START	5.7 mph
WIND SPEED STOP	7.7 mph
WIND DIRECTION START	WNW
WIND DIRECTION STOP	WNW
AMBIENT TEMP. START	40.6°F
AMBIENT TEMP. STOP	40.6°F
WET BULB TEMP.	36.1°F
RH, percent	48.7%

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/25/08	1143	1213

MIN \ SEC	0	15	30	45	COMMENTS
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3	0	0	0	0	
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5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 √	TVEE METHOD 1 ☐
TVEE METHOD 2 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE 20% WERE	0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	11/25/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	9212 STA 32626
DATE	11/25/08

COMMENTS

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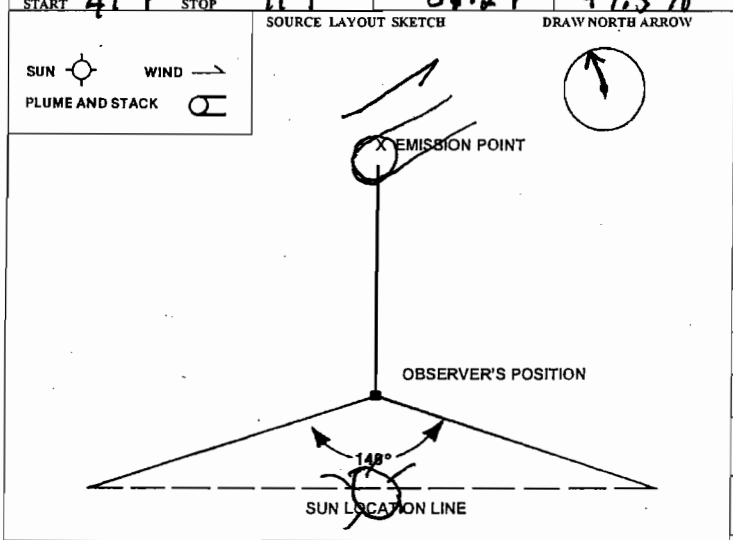
VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Chemical Processing/Recovering - Stack 28
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-A; 01-1020-72
PROCESS EQUIPMENT	Glove boxes, Furnaces, Hoods
OPERATING MODE	In Service
CONTROL EQUIPMENT	HEPA Filter
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT	START Round 4.0' Diameter Stack STOP Same
HEIGHT ABOVE GROUND LEVEL	START 80' STOP Same
HEIGHT RELATIVE TO OBSERVER	START 50' STOP 50'
DISTANCE FROM OBSERVER	START 40' STOP 40'
DIRECTION FROM OBSERVER	START SW STOP SW
DESCRIBE VISIBLE EMISSIONS	START No Visible Emissions Observed STOP
EMISSION COLOR	START Clear STOP Same
IF WATER DROPLETT PLUME	N/A ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START Stack Exit STOP Stack Exit
DESCRIBE PLUME BACKGROUND	START Slightly Cloudy sky STOP Slightly Blue Sky
BACKGROUND COLOR	START Blue sky STOP Same
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 6.3 mph STOP 6.5 mph
WIND DIRECTION	START W STOP W
AMBIENT TEMP.	START 41°F STOP 41°F
WET BULB TEMP.	36.2°F
RH, percent	47.5%

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/25/08	1220	1250

MIN \ SEC	0	15	30	45	COMMENTS
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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 √	TVEE METHOD 1 ☐
TVEE METHOD 2 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE 20% WERE	0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	11/25/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	9212 STA 39626
DATE	11/25/08

COMMENTS

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TITLE DATE

CN-0841 Original – File Canary – Facility RDA – 1298

DEPT. OF ENVIRONMENT & CONSERVATION

AIR POLLUTION CONTROL

VISIBLE EMISSION OBSERVATION

SOURCE NAME B&W Y-12 National Security Complex – Chemical Processing/Recovering - Stack 33	OBSERVATION DATE 11/26/08	START TIME 1035	STOP TIME 1105
ADDRESS P.O. BOX 2009			
Bear Creek Road			
CITY Oak Ridge	STATE TN	ZIP 37831	
PHONE (865) 576-6013	SOURCE ID NUMBER 9212-A; 01-1020-72		
PROCESS EQUIPMENT Glove boxes, Furnaces, Hoods	OPERATING MODE In Service		
CONTROL EQUIPMENT Prefilter/HEPA Filter	OPERATING MODE Full Capacity		

DESCRIBE EMISSION POINT
START Round 3.50' Diameter Stack STOP Same

HEIGHT ABOVE GROUND LEVEL
START 72' STOP Same

HEIGHT RELATIVE TO OBSERVER
START 65' STOP 65'

DISTANCE FROM OBSERVER
START 50' STOP 50'

DIRECTION FROM OBSERVER
START SW STOP SW

DESCRIBE VISIBLE EMISSIONS
START No Visible Emissions observed STOP

EMISSION COLOR
START None STOP None

IF WATER DROPLETT PLUME N/A
ATTACHED ☐ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START Stack Exit STOP Stack Exit

DESCRIBE PLUME BACKGROUND
START Clear Blue Sky STOP Same

BACKGROUND COLOR
START Blue sky STOP Same

SKY CONDITIONS
START Clear STOP Clear

WIND SPEED
START 3.5 mph STOP 5.4 mph

WIND DIRECTION
START SW STOP SW

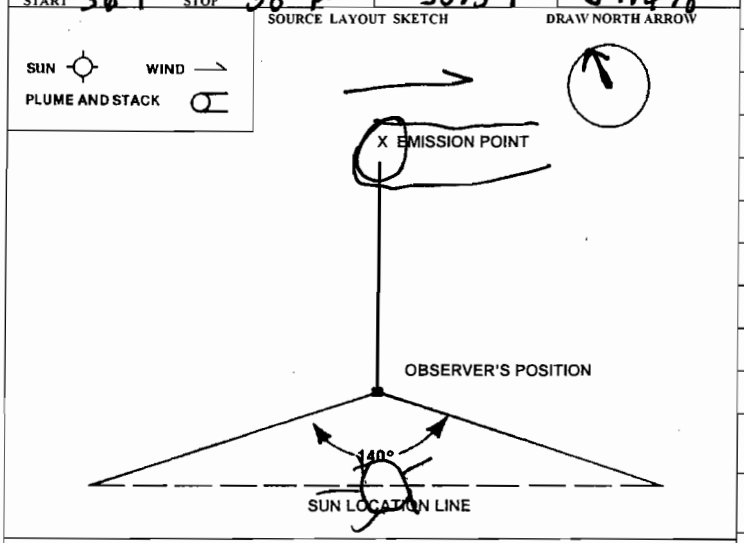
AMBIENT TEMP.
START 36°F STOP 38°F

WET BULB TEMP. 33.3°F

RH, percent 64.4%

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



SEC / MIN	0	15	30	45	COMMENTS
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30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY

EPA METHOD 9 √ TVEE METHOD 2 ☐ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD 0

NUMBER OF READINGS ABOVE 20% WERE 0

COMMENTS

OBSERVER'S NAME Johnny Skinner

OBSERVER'S SIGNATURE Johnny Skinner

DATE 11/26/08

ORGANIZATION ES&H – Clean Air Program

CERTIFICATION EXPIRATION DATE April 12, 2009

VERIFIED BY [signature] 9212 STA 34626

DATE 11/26/08

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SIGNATURE

TITLE

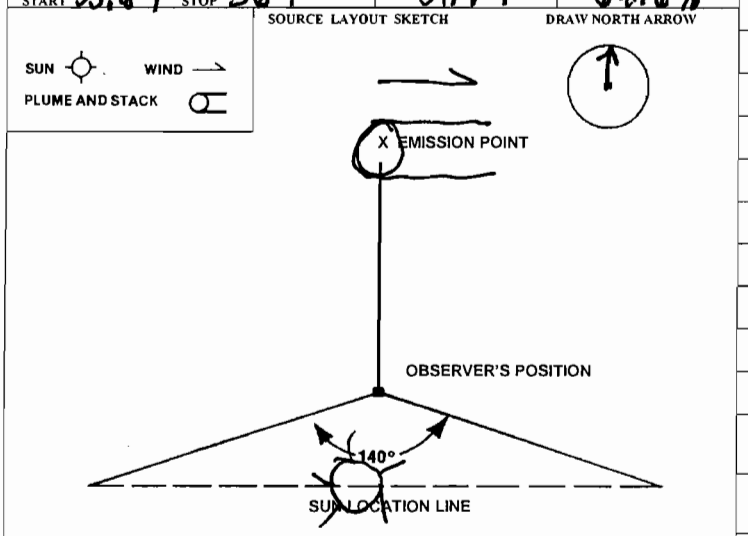
DATE

CN-0841 Original – File Canary – Facility RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME B&W Y-12 National Security Complex – Chemical Processing/Recovering - Stack 40	OBSERVATION DATE 11/26/08	START TIME 1000 / STOP TIME 1030
ADDRESS P.O. BOX 2009		
Bear Creek Road		
CITY Oak Ridge / STATE TN / ZIP 37831		
PHONE (865) 576-6013 / SOURCE ID NUMBER 9212-A; 01-1020-72		
PROCESS EQUIPMENT Hoods and Pour-up Station / OPERATING MODE In Service		
CONTROL EQUIPMENT HEPA Filter / OPERATING MODE Full Capacity		
DESCRIBE EMISSION POINT START Round 1.70' Diameter Stack STOP Same		
HEIGHT ABOVE GROUND LEVEL START 48' STOP Same	HEIGHT RELATIVE TO OBSERVER START 30' STOP 30'	
DISTANCE FROM OBSERVER START 35' STOP 35'	DIRECTION FROM OBSERVER START S STOP S	
DESCRIBE VISIBLE EMISSIONS START No visible emissions STOP observed		
EMISSION COLOR START None STOP None	IF WATER DROPLETT PLUME N/A ATTACHED ☐ DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START Stack Exit STOP Stack Exit		
DESCRIBE PLUME BACKGROUND START Clear Blue sky STOP Same		
BACKGROUND COLOR START Blue sky STOP Same	SKY CONDITIONS START Clear STOP Clear	
WIND SPEED START 2.6 mph STOP 3.5 mph	WIND DIRECTION START SW STOP SW	
AMBIENT TEMP. START 33.6°F STOP 36°F	WET BULB TEMP. 31.9°F	RH, percent 64.6%

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



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3	0	0	0	0	
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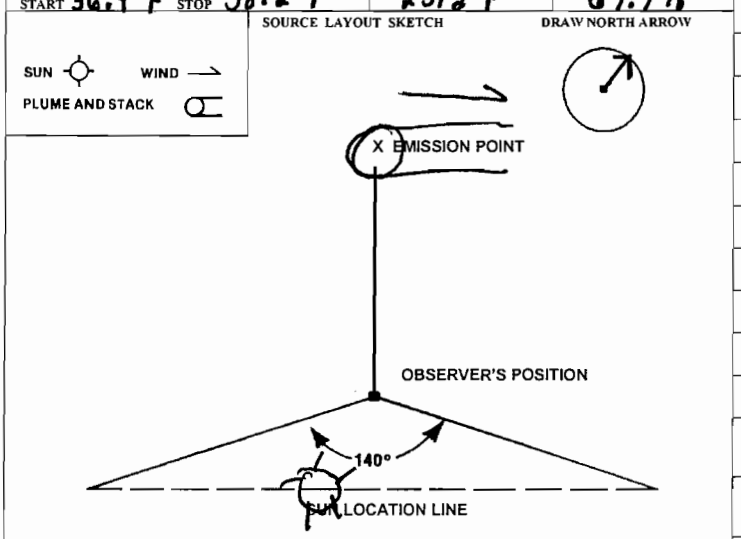
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY	EPA METHOD 9 √ / TVEE METHOD 1 ☐	TVEE METHOD 2 ☐ / TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD 0	NUMBER OF READINGS ABOVE 20% WERE 0	
COMMENTS	OBSERVER'S NAME Johnny Skinner	
	OBSERVER'S SIGNATURE Johnny Skinner	DATE 11/26/08
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE	ORGANIZATION ES&H – Clean Air Program	CERTIFICATION EXPIRATION DATE April 12, 2009
TITLE / DATE	VERIFIED BY [signature] 9212 STA 39626	DATE 11/26/08

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Special Processing - Stack 44
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-C; 01-0020-05
PROCESS EQUIPMENT	Leaching Hood
OPERATING MODE	In Service
CONTROL EQUIPMENT	Demister
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT	Rectangular
START	2.58' x 3.67' Diameter Stack
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	49'
HEIGHT ABOVE GROUND LEVEL STOP	Same
HEIGHT RELATIVE TO OBSERVER START	34'
HEIGHT RELATIVE TO OBSERVER STOP	34'
DISTANCE FROM OBSERVER START	35'
DISTANCE FROM OBSERVER STOP	35'
DIRECTION FROM OBSERVER START	SE
DIRECTION FROM OBSERVER STOP	SE
DESCRIBE VISIBLE EMISSIONS START	No visible emissions observed
STOP	
EMISSION COLOR START	Clear
EMISSION COLOR STOP	Clear
IF WATER DROPLETT PLUME	N/A
ATTACHED ☐	DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	Clear Blue Sky
STOP	Same
BACKGROUND COLOR START	Blue
BACKGROUND COLOR STOP	Blue
SKY CONDITIONS START	Clear
SKY CONDITIONS STOP	Clear
WIND SPEED START	5.20 mph
WIND SPEED STOP	8.40 mph
WIND DIRECTION START	SW
WIND DIRECTION STOP	SW
AMBIENT TEMP. START	36.9 °F
AMBIENT TEMP. STOP	38.2 °F
WET BULB TEMP.	23.2 °F
RH, percent	67.7%

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/19/08	1220	1250

MIN \ SEC	0	15	30	45	COMMENTS
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30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY	EPA METHOD 9 ☐ TVEE METHOD 2 √ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD 0	NUMBER OF READINGS ABOVE 20% WERE 0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	11/19/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Keith A. W. [illegible]
DATE	11/19/08

COMMENTS

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SIGNATURE

TITLE DATE

CN-0841 Original – File Canary – Facility RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME B&W Y-12 National Security Complex – Special Processing - Stack 45	OBSERVATION DATE 11/19/08	START TIME 1255	STOP TIME 1325
ADDRESS P.O. BOX 2009			
Bear Creek Road			
CITY Oak Ridge	STATE TN	ZIP 37831	
PHONE (865) 576-6013	SOURCE ID NUMBER 9212-C; 01-0020-05		
PROCESS EQUIPMENT Glovebox and Hoods	OPERATING MODE In Service		
CONTROL EQUIPMENT HEPA Filter	OPERATING MODE Full Capacity		

DESCRIBE EMISSION POINT Rectangular
START 3.17' x 3.50' Diameter Stack STOP Same

HEIGHT ABOVE GROUND LEVEL START 42' STOP Same
HEIGHT RELATIVE TO OBSERVER START 15' STOP 15'

DISTANCE FROM OBSERVER START 30' STOP 30'
DIRECTION FROM OBSERVER START SE STOP SE

DESCRIBE VISIBLE EMISSIONS
START No Visible emissions observed STOP

EMISSION COLOR START Clear STOP Clear
IF WATER DROPLETT PLUME N/A
ATTACHED ☐ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START Stack Exit STOP Stack Exit

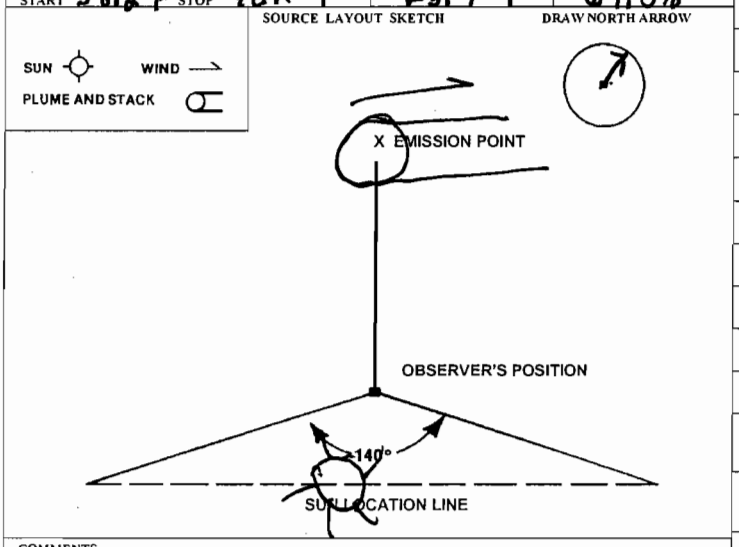
DESCRIBE PLUME BACKGROUND
START Clear Blue sky STOP Same

BACKGROUND COLOR START Blue STOP Blue
SKY CONDITIONS START Clear STOP Clear

WIND SPEED START 8-10 mph STOP 8 mph
WIND DIRECTION START SW STOP SW

AMBIENT TEMP. START 38.2°F STOP 40.1°F
WET BULB TEMP. 23.7°F
RH, percent 69.3%

SOURCE LAYOUT SKETCH DRAW NORTH ARROW



MIN \ SEC	0	15	30	45	COMMENTS
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27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY
EPA METHOD 9 ☐ TVEE METHOD 2 √ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD 0
NUMBER OF READINGS ABOVE 20% WERE 0

COMMENTS

OBSERVER'S NAME Johnny Skinner
OBSERVER'S SIGNATURE Johnny Skinner
DATE 11/19/08
ORGANIZATION ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE April 12, 2009
VERIFIED BY Keith A. Walker
DATE 11/19/08

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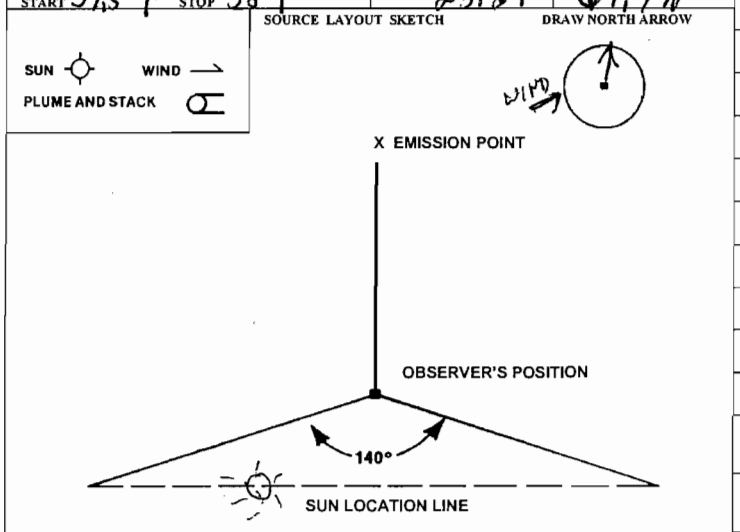
SIGNATURE
TITLE
DATE

CN-0841 Original – File Canary – Facility RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Special Processing - Stack 46
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-C; 01-0020-05
PROCESS EQUIPMENT	Tray Dissolvers and Tank Vents
OPERATING MODE	In Service
CONTROL EQUIPMENT	N/A
OPERATING MODE	N/A
DESCRIBE EMISSION POINT	Square
START	1.50' x 1.50' Diameter Stack
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	51'
HEIGHT ABOVE GROUND LEVEL STOP	Same
HEIGHT RELATIVE TO OBSERVER START	12'
HEIGHT RELATIVE TO OBSERVER STOP	12'
DISTANCE FROM OBSERVER START	25'
DISTANCE FROM OBSERVER STOP	25'
DIRECTION FROM OBSERVER START	N
DIRECTION FROM OBSERVER STOP	N
DESCRIBE VISIBLE EMISSIONS START	NONE
STOP	NONE
EMISSION COLOR START	CLEAR
STOP	CLEAR
IF WATER DROPLETT PLUME	N/A (circled) ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	BROWN LEAVES
STOP	BROWN LEAVE
BACKGROUND COLOR START	BROWN
STOP	BROWN
SKY CONDITIONS START	CLEAR
SKY CONDITIONS STOP	CLEAR
WIND SPEED START	6.3 mph
WIND SPEED STOP	10 mph
WIND DIRECTION START	SW
WIND DIRECTION STOP	SW
AMBIENT TEMP. START	37.5°F
AMBIENT TEMP. STOP	38°F
WET BULB TEMP.	23.2°F
RH, percent	67.7%

SOURCE LAYOUT SKETCH



OBSERVATION DATE	START TIME	STOP TIME
11-19-08	1230	1300

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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY	EPA METHOD 9 ☐ TVEE METHOD 1 ☐ TVEE METHOD 2 √ TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD 0	NUMBER OF READINGS ABOVE 20% WERE 0
OBSERVER'S NAME	~~Johnny Skinner~~ Mark A. Burdette
OBSERVER'S SIGNATURE	Mark A Burdette
DATE	11-19-08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Keith A. Walker
DATE	11-19-08

COMMENTS

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SIGNATURE

TITLE DATE

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Special Processing - Stack 47
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-C; 01-0020-05
PROCESS EQUIPMENT	Tray Dissolvers
OPERATING MODE	In Service
CONTROL EQUIPMENT	N/A
OPERATING MODE	N/A
DESCRIBE EMISSION POINT	Square
START	1.83' x 1.83' Diameter Stack
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	51'
HEIGHT ABOVE GROUND LEVEL STOP	Same
HEIGHT RELATIVE TO OBSERVER START	18'
HEIGHT RELATIVE TO OBSERVER STOP	18'
DISTANCE FROM OBSERVER START	50'
DISTANCE FROM OBSERVER STOP	
DIRECTION FROM OBSERVER START	N
DIRECTION FROM OBSERVER STOP	N
DESCRIBE VISIBLE EMISSIONS START	NONE
DESCRIBE VISIBLE EMISSIONS STOP	NONE
EMISSION COLOR START	CLEAR
EMISSION COLOR STOP	CLEAR
IF WATER DROPLETT PLUME ATTACHED ☐	N/A
DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	Stack Exit
STOP	Stack Exit
DESCRIBE PLUME BACKGROUND START	CLEAR SKY
STOP	CLEAR SKY
BACKGROUND COLOR START	BLUE
BACKGROUND COLOR STOP	BLUE
SKY CONDITIONS START	CLEAR
SKY CONDITIONS STOP	CLEAR
WIND SPEED START	10 mph
WIND SPEED STOP	9.20 mph
WIND DIRECTION START	SW
WIND DIRECTION STOP	SW
AMBIENT TEMP. START	38.6°F
AMBIENT TEMP. STOP	40.1°F
WET BULB TEMP.	23.7°F
RH. percent	69.3 %

OBSERVATION DATE	START TIME	STOP TIME
11/19/08	1305	1335

MIN \ SEC	0	15	30	45	COMMENTS
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28	0	0	0	0	
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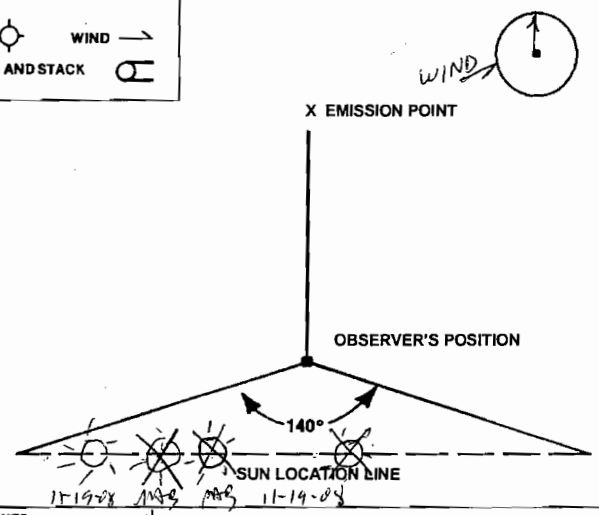
30	0	0	0	0	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW

SUN — WIND — PLUME AND STACK



APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 ☐	TVEE METHOD 2 √
TVEE METHOD 1 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	
NUMBER OF READINGS ABOVE 20% WERE	
COMMENTS	Relocated ~~twice~~ three times prior to start of readings
OBSERVER'S NAME	Mark A. Burdette
OBSERVER'S SIGNATURE	Mark A. Burdette
DATE	11/19/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Keith A. Wilt
DATE	11/19/08
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SIGNATURE	
TITLE	
DATE	

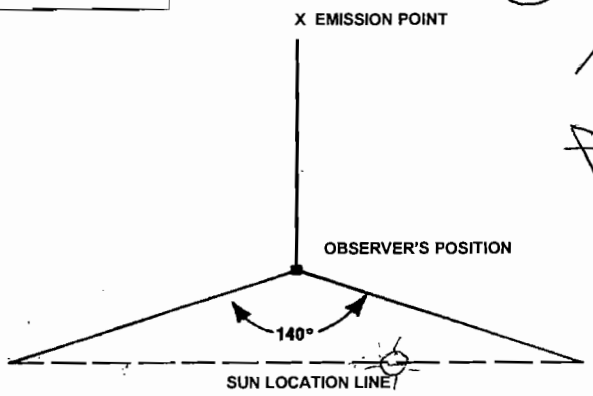
VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Special Processing - Stack 113
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-C; 01-0020-05
PROCESS EQUIPMENT	Tray Dissolvers
OPERATING MODE	In Service
CONTROL EQUIPMENT	Fume Scrubber
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT	START Round 1.0' Diameter Stack STOP Same
HEIGHT ABOVE GROUND LEVEL	START 50' STOP Same
HEIGHT RELATIVE TO OBSERVER	START 15' STOP 15'
DISTANCE FROM OBSERVER	START 35' STOP 35'
DIRECTION FROM OBSERVER	START NE STOP NE
DESCRIBE VISIBLE EMISSIONS	START NONE STOP NONE
EMISSION COLOR	START CLEAR STOP CLEAR
IF WATER DROPLETT PLUME	(N/A) ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START Stack Exit STOP Stack Exit
DESCRIBE PLUME BACKGROUND	START CLEAR SKY STOP CLEAR SKY
BACKGROUND COLOR	START BLUE STOP BLUE
SKY CONDITIONS	START CLEAR STOP
WIND SPEED	START 3-5 mph STOP 3-5 mph
WIND DIRECTION	START SW STOP SW
AMBIENT TEMP.	START 35.9°F STOP 37.5°F
WET BULB TEMP.	25.1°F
RH, percent	66.8%

SOURCE LAYOUT SKETCH

SUN WIND
PLUME AND STACK

DRAW NORTH ARROW



MAB 11/19/08

OBSERVATION DATE	START TIME	STOP TIME
11/19/08	1153	1223

MIN \ SEC	0	15	30	45	COMMENTS
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28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 ☐	TVEE METHOD 2 √
TVEE METHOD 1 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE 20% WERE	0
OBSERVER'S NAME	Mark A. Burdette
OBSERVER'S SIGNATURE	Mark A Burdette
DATE	11/19/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Keith A. Willi
DATE	11/19/08

COMMENTS

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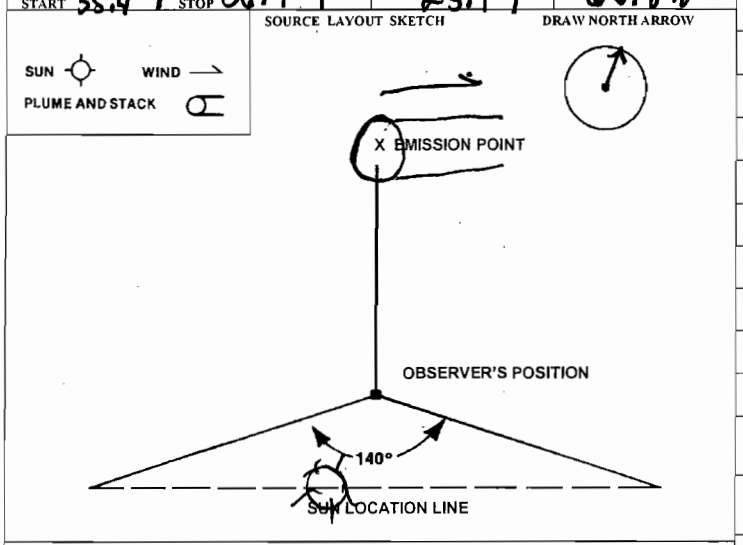
SIGNATURE

TITLE DATE

VISIBLE EMISSION OBSERVATION

SOURCE NAME	B&W Y-12 National Security Complex – Special Processing - Stack 128
ADDRESS	P.O. BOX 2009
	Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	9212-C; 01-0020-05
PROCESS EQUIPMENT	Tank Vents and Hoods
OPERATING MODE	In Service
CONTROL EQUIPMENT	Demister
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT	START Round 1.0' Diameter Stack STOP Same
HEIGHT ABOVE GROUND LEVEL	START 40' STOP Same
HEIGHT RELATIVE TO OBSERVER	START 25' STOP 25'
DISTANCE FROM OBSERVER	START 35' STOP 35'
DIRECTION FROM OBSERVER	START SE STOP SE
DESCRIBE VISIBLE EMISSIONS	START No visible emissions observed STOP
EMISSION COLOR	START Clear STOP Clear
IF WATER DROPLETT PLUME	N/A ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START Stack Exit STOP Stack Exit
DESCRIBE PLUME BACKGROUND	START Clear Blue sky STOP Same
BACKGROUND COLOR	START Blue STOP Blue
SKY CONDITIONS	START Clear STOP Clear
WIND SPEED	START 4.6 mph STOP 5.2 mph
WIND DIRECTION	START SW STOP SW
AMBIENT TEMP.	START 35.4 °F STOP 36.9 °F
WET BULB TEMP.	25.1 °F
RH, percent	66.8 %

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
11/19/08	11:45	12:15

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30	0	0	0	0	

APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 ☐	TVEE METHOD 2 √
TVEE METHOD 1 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE 20% WERE	0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	11/19/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Keith A. Willis
DATE	11/19/08

COMMENTS

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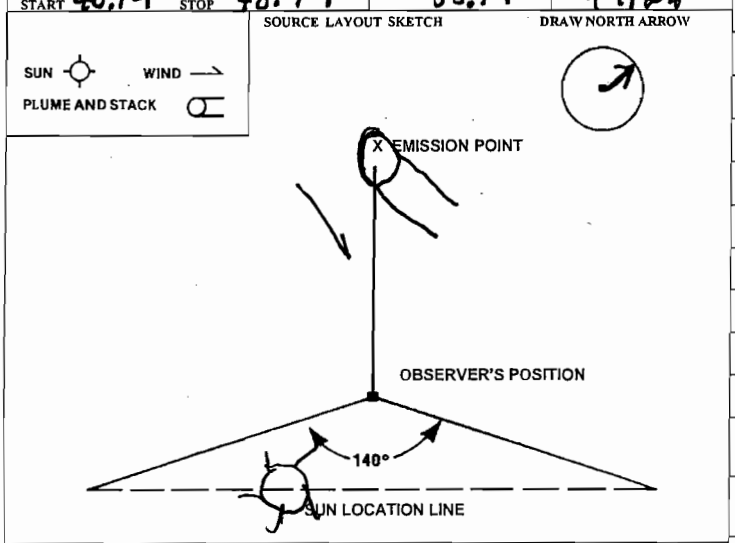
TITLE DATE

CN-0841 Original – File Canary – Facility RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME B&W Y-12 National Security Complex – Chemical Processing/Recovering - Stack 134	OBSERVATION DATE 11/25/08	START TIME 1110	STOP TIME 1140
ADDRESS P.O. BOX 2009			
Bear Creek Road			
CITY Oak Ridge	STATE TN	ZIP 37831	
PHONE (865) 576-6013	SOURCE ID NUMBER 9212-A; 01-1020-72		
PROCESS EQUIPMENT Glove boxes, Dissolvers, Hoods	OPERATING MODE In Service		
CONTROL EQUIPMENT Scrubber/Prefilter/HEPA Filter	OPERATING MODE Full Capacity		
DESCRIBE EMISSION POINT START Round 5.50' Diameter Stack	STOP Same		
HEIGHT ABOVE GROUND LEVEL START 82' STOP Same	HEIGHT RELATIVE TO OBSERVER START 40' STOP 40'		
DISTANCE FROM OBSERVER START 45' STOP 45'	DIRECTION FROM OBSERVER START SE STOP SE		
DESCRIBE VISIBLE EMISSIONS START No visible Emissions observed	STOP		
EMISSION COLOR START Clear STOP Same	IF WATER DROPLETT PLUME N/A ATTACHED ☐ DETACHED ☐		
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START Stack Exit	STOP Stack Exit		
DESCRIBE PLUME BACKGROUND START Partly Cloudy sky	STOP Same		
BACKGROUND COLOR START Partly Blue STOP Same	SKY CONDITIONS START Partly Cloudy STOP Same		
WIND SPEED START 7.5 mph STOP 5.7 mph	WIND DIRECTION START WNW STOP WNW		
AMBIENT TEMP. START 40.7°F STOP 40.7°F	WET BULB TEMP. 35.7°F	RH, percent 49.2%	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



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30	0	0	0	0	

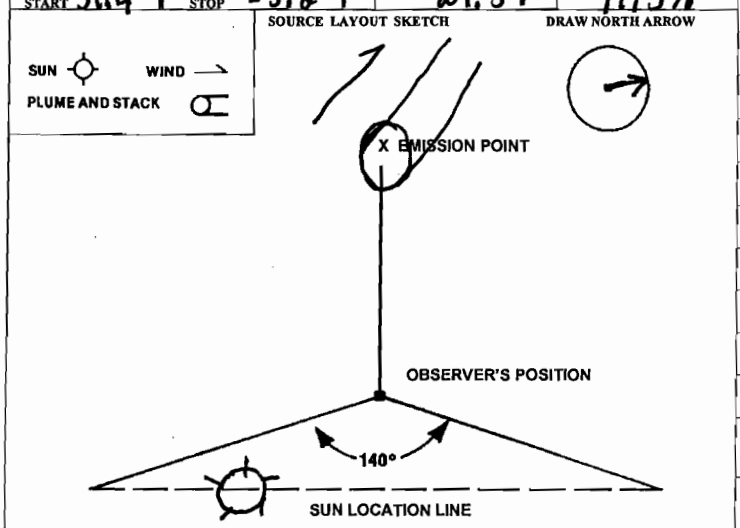
APPLICABLE OPACITY STANDARD 20 % OPACITY	EPA METHOD 9 √ TVEE METHOD 1 ☐	TVEE METHOD 2 ☐ TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD 0	NUMBER OF READINGS ABOVE 20% WERE 0	
COMMENTS	OBSERVER'S NAME Johnny Skinner	
	OBSERVER'S SIGNATURE Johnny Skinner	DATE 11/25/08
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE	ORGANIZATION ES&H – Clean Air Program	CERTIFICATION EXPIRATION DATE April 12, 2009
TITLE / DATE	VERIFIED BY [signature] 4212 STA 39626	DATE 11/25/08

CN-0841 Original – File Canary – Facility RDA – 1298

VISIBLE EMISSION OBSERVATION

SOURCE NAME	Oak Ridge Y-12 Steam Plant West Stack 170
ADDRESS	Y-12 National Security Complex
	P.O. BOX 2009 Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 574-4033
SOURCE ID NUMBER	9401-3; 10-1020-31
PROCESS EQUIPMENT	Coal-Fired Boiler 1
OPERATING MODE	105,000 lbs steam/hr
CONTROL EQUIPMENT	Baghouse 1
OPERATING MODE	$\Delta P = 3.9''$ H_2O
DESCRIBE EMISSION POINT	START Round 12.5' Smoke Stack STOP Same
HEIGHT ABOVE GROUND LEVEL	START 190' STOP 190'
HEIGHT RELATIVE TO OBSERVER	START 170' STOP 170'
DISTANCE FROM OBSERVER	START 300' STOP 300'
DIRECTION FROM OBSERVER	START E STOP E
DESCRIBE VISIBLE EMISSIONS	START NO Visible emissions observed STOP
EMISSION COLOR	START None STOP Same
IF WATER DROPLETT PLUME	N/A ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED	START Stack Exit STOP Stack Exit
DESCRIBE PLUME BACKGROUND	START Scattered clouds STOP Same
BACKGROUND COLOR	START Scattered Blue STOP Same
SKY CONDITIONS	START Scattered clouds STOP Same
WIND SPEED	START 1.1 mph STOP 2 mph
WIND DIRECTION	START SE STOP SE
AMBIENT TEMP.	START 31.4 °F STOP 33.2 °F
WET BULB TEMP.	29.3 °F
RH, percent	71.3%

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



OBSERVATION DATE	START TIME	STOP TIME
12/3/08	0915	0945

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30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY	EPA METHOD 9 √ TVEE METHOD 2 ☐ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD 0	NUMBER OF READINGS ABOVE 20% WERE 0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner — DATE 12/3/08
ORGANIZATION	ES&H – Clean Air Program
CERTIFICATION EXPIRATION DATE	April 12, 2009
VERIFIED BY	Peter S Wittig — DATE 12/3/08

COMMENTS

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SIGNATURE

TITLE

DATE

VISIBLE EMISSION OBSERVATION

SOURCE NAME: Oak Ridge Y-12 Steam Plant - East Stack 171	OBSERVATION DATE: 2/5/2009	START TIME: 1010	STOP TIME: 1040

ADDRESS: Y-12 National Security Complex
P.O. BOX 2009
Bear Creek Road

CITY: Oak Ridge | STATE: TN | ZIP: 37831

PHONE: (865) 574-4033 | SOURCE ID NUMBER: 9401-3; 10-1020-31

PROCESS EQUIPMENT: Coal-Fired Boiler 4 | OPERATING MODE: 130,000 lb steam/hr

CONTROL EQUIPMENT: Baghouse 4 | OPERATING MODE: ΔP = 4.6 in H_2O

DESCRIBE EMISSION POINT
START Round 15' Smoke Stack STOP Same

HEIGHT ABOVE GROUND LEVEL
START 190' STOP 190'

HEIGHT RELATIVE TO OBSERVER
START 170' STOP 170'

DISTANCE FROM OBSERVER
START 270' STOP 270'

DIRECTION FROM OBSERVER
START E STOP E

DESCRIBE VISIBLE EMISSIONS
START No visible emissions observed STOP

EMISSION COLOR
START None STOP None

IF WATER DROPLETT PLUME N/A
ATTACHED ☐ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START Stack Exit STOP Stack Exit

DESCRIBE PLUME BACKGROUND
START Clear sky STOP Same

BACKGROUND COLOR
START Blue STOP Blue

SKY CONDITIONS
START Clear STOP clear

WIND SPEED
START 2.1 mph STOP 3.2 mph

WIND DIRECTION
START E STOP E

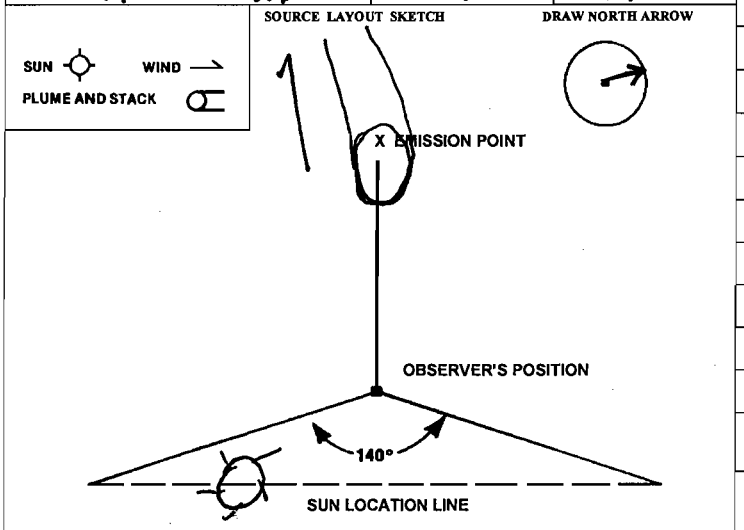
AMBIENT TEMP.
START 17.4 °F STOP 18.6 °F

WET BULB TEMP. 17.1 °F

RH, percent 56.9 %

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



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30	0	0	0	0	

APPLICABLE OPACITY STANDARD 20 % OPACITY
EPA METHOD 9 √ TVEE METHOD 2 ☐ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD 0

NUMBER OF READINGS ABOVE 20% WERE 0

COMMENTS

OBSERVER'S NAME: Johnny Skinner

OBSERVER'S SIGNATURE: Johnny Skinner | DATE: 2/5/09

ORGANIZATION: ES&H – Clean Air Program | CERTIFICATION EXPIRATION DATE: April 12, 2009

VERIFIED BY: Rose L Wit | DATE: 2/5/09

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TITLE | DATE

VISIBLE EMISSION OBSERVATION

SOURCE NAME	Graphite Carbon Machine Shop-Building 9201-1-Stack 279
OBSERVATION DATE	9/27/05
START TIME	1245
STOP TIME	1315
ADDRESS	Y-12 National Security Complex P.O. Box 2009 Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	Y-9201-1-C; 01-0080-17
PROCESS EQUIPMENT	Machining Equipment
OPERATING MODE	IN Service
CONTROL EQUIPMENT	Panborn Dust Collector Baghouse
OPERATING MODE	Full
DESCRIBE EMISSION POINT START	Rectangular 30" X 37" Stack Vent
DESCRIBE EMISSION POINT STOP	SAME
HEIGHT ABOVE GROUND LEVEL START	12'
HEIGHT ABOVE GROUND LEVEL STOP	12'
HEIGHT RELATIVE TO OBSERVER START	12'
HEIGHT RELATIVE TO OBSERVER STOP	12'
DISTANCE FROM OBSERVER START	40'
DISTANCE FROM OBSERVER STOP	40'
DIRECTION FROM OBSERVER START	SW
DIRECTION FROM OBSERVER STOP	SW
DESCRIBE VISIBLE EMISSIONS START	NONE
DESCRIBE VISIBLE EMISSIONS STOP	NONE
EMISSION COLOR START	NONE
EMISSION COLOR STOP	NONE
IF WATER DROPLETT PLUME	N/A ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	@ Stack Exit
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED STOP	@ Stack Exit
DESCRIBE PLUME BACKGROUND START	Vent obscured by building
DESCRIBE PLUME BACKGROUND STOP	SAME
BACKGROUND COLOR START	Blue
BACKGROUND COLOR STOP	Blue
SKY CONDITIONS START	Partly Cloudy
SKY CONDITIONS STOP	Partly Cloudy
WIND SPEED START	6 mph
WIND SPEED STOP	6 mph
WIND DIRECTION START	E
WIND DIRECTION STOP	E
AMBIENT TEMP. START	75°F
AMBIENT TEMP. STOP	75°F
WET BULB TEMP.	—
RH, percent	59%

SEC / MIN	0	15	30	45	COMMENTS
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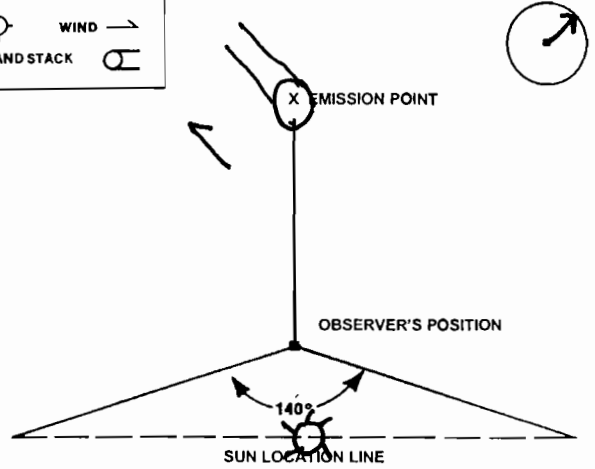
SOURCE LAYOUT SKETCH — DRAW NORTH ARROW

SUN — WIND — PLUME AND STACK



APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9 ☐	TVEE METHOD 2 ✓
TVEE METHOD 1 ☐	TVEE METHOD 3 ☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READINGS ABOVE	20 % WERE 0
OBSERVER'S NAME	Johnny Skinner
OBSERVER'S SIGNATURE	Johnny Skinner
DATE	9/27/05
ORGANIZATION	ES&H - Clean Air Program
CERTIFICATION EXPIRATION DATE	10/11/05
VERIFIED BY	BK Moe
DATE	9/27/05

COMMENTS

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TITLE

DATE

CN-0841 Original – File Canary - Facility RDA – 1298

DEPT. OF ENVIRONMENT & CONSERVATION

AIR POLLUTION CONTROL

VISIBLE EMISSION OBSERVATION

SOURCE NAME: Plating Shop - Building 9201-5N - Stack 239	OBSERVATION DATE: 6/23/05	START TIME: 0939	STOP TIME: 1009

ADDRESS: Y-12 National Security Complex
P.O. Box 2009
Bear Creek Road

CITY: Oak Ridge | STATE: TN | ZIP: 37831

PHONE: (865) 576-6013 | SOURCE ID NUMBER: 9201-5N-B; 01-0020-30

PROCESS EQUIPMENT: Plating Equipment/Acid Tanks | OPERATING MODE: In Service

CONTROL EQUIPMENT: NONE | OPERATING MODE: N/A

DESCRIBE EMISSION POINT: START Round 3.5' Diameter Stack | STOP SAME

HEIGHT ABOVE GROUND LEVEL: START 34' STOP 34' | HEIGHT RELATIVE TO OBSERVER: START 37' STOP 37'

DISTANCE FROM OBSERVER: START 80' STOP 80' | DIRECTION FROM OBSERVER: START NW STOP NW

DESCRIBE VISIBLE EMISSIONS: START NONE | STOP NONE

EMISSION COLOR: START NONE STOP NONE | IF WATER DROPLETT PLUME: ATTACHED ☐ DETACHED ☐ N/A

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START @ Stack Exit | STOP @ Stack Exit

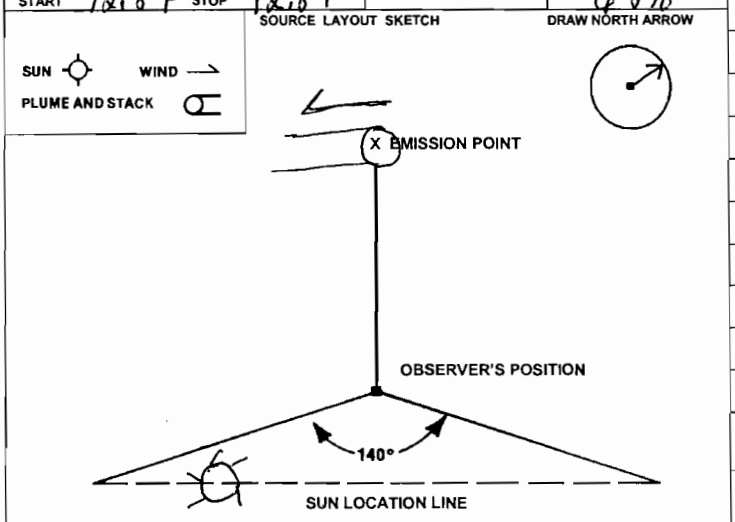
DESCRIBE PLUME BACKGROUND: START Slightly Haze sky | STOP SAME

BACKGROUND COLOR: START Blue STOP Blue | SKY CONDITIONS: START Slightly Haze STOP Slightly Haze

WIND SPEED: START 4.5 mph STOP 4.5 mph | WIND DIRECTION: START NE STOP NE

AMBIENT TEMP.: START 72.8°F STOP 72.8°F | WET BULB TEMP.: — | RH, percent: 68%

SOURCE LAYOUT SKETCH | DRAW NORTH ARROW



MIN \ SEC	0	15	30	45	COMMENTS
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30	0	0	0	0	

APPLICABLE OPACITY STANDARD: 20 % OPACITY | EPA METHOD 9 ☐ | TVEE METHOD 2 ☑ | TVEE METHOD 1 ☐ | TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD: 0 | NUMBER OF READINGS ABOVE 20 % WERE 0

COMMENTS

OBSERVER'S NAME: Johnny Skinner

OBSERVER'S SIGNATURE: Johnny Skinner | DATE: 6/23/05

ORGANIZATION: ES&H-Clean Air Program | CERTIFICATION EXPIRATION DATE: 10-11-05

VERIFIED BY: [signature] | DATE: 6-23-05

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TITLE | DATE

CN-0841 Original – File Canary - Facility RDA – 1298

DEPT. OF ENVIRONMENT & CONSERVATION

AIR POLLUTION CONTROL

VISIBLE EMISSION OBSERVATION

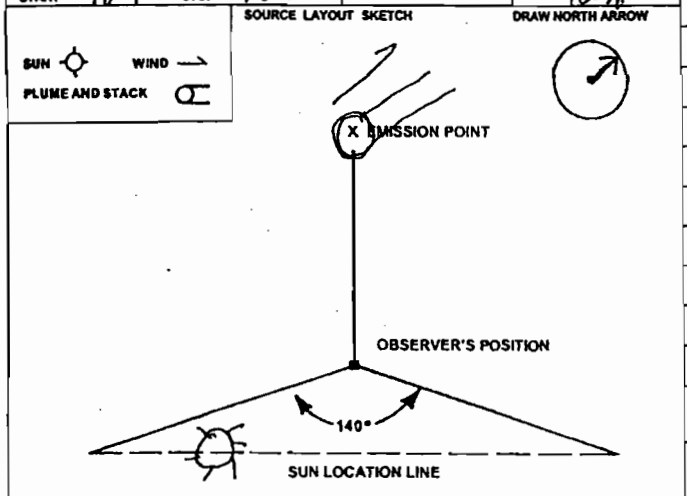
SOURCE NAME	Beryllium Laboratory - Building 9202 EPN 160
ADDRESS	Y-12 National Security Complex P.O. Box 2009 Bear Creek Road
CITY	Oak Ridge
STATE	TN
ZIP	37831
PHONE	(865) 576-6013
SOURCE ID NUMBER	Y-9202-A' 01-0080-06
PROCESS EQUIPMENT	Laboratory Equipment
OPERATING MODE	Smearing & Sampling
CONTROL EQUIPMENT	HEPA System
OPERATING MODE	0.9" H_2O
DESCRIBE EMISSION POINT START	Round 40" Stack
DESCRIBE EMISSION POINT STOP	SAME
HEIGHT ABOVE GROUND LEVEL START	71'
HEIGHT ABOVE GROUND LEVEL STOP	71'
HEIGHT RELATIVE TO OBSERVER START	71'
HEIGHT RELATIVE TO OBSERVER STOP	71'
DISTANCE FROM OBSERVER START	100'
DISTANCE FROM OBSERVER STOP	100'
DIRECTION FROM OBSERVER START	NW
DIRECTION FROM OBSERVER STOP	NW
DESCRIBE VISIBLE EMISSIONS START	NONE
DESCRIBE VISIBLE EMISSIONS STOP	NONE
EMISSION COLOR START	NONE
EMISSION COLOR STOP	NONE
IF WATER DROPLETT PLUME	N/A
ATTACHED ☐	
DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	@ Stack Exit
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED STOP	@ Stack Exit
DESCRIBE PLUME BACKGROUND START	Clear Sky
DESCRIBE PLUME BACKGROUND STOP	Clear Sky
BACKGROUND COLOR START	Blue
BACKGROUND COLOR STOP	Blue
SKY CONDITIONS START	Few Clouds
SKY CONDITIONS STOP	Few Clouds
WIND SPEED START	2.1 mph
WIND SPEED STOP	2.1 mph
WIND DIRECTION START	S
WIND DIRECTION STOP	S
AMBIENT TEMP. START	78°F
AMBIENT TEMP. STOP	78°F
WET BULB TEMP.	—
RH, percent	72%

OBSERVATION DATE	START TIME	STOP TIME
7/21/05	0945	1045

MIN \ SEC	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

SOURCE LAYOUT SKETCH

DRAW NORTH ARROW



APPLICABLE OPACITY STANDARD: 20 % OPACITY

EPA METHOD 9 ☐ TVEE METHOD 2 ☐ TVEE METHOD 1 ☐ TVEE METHOD 3 ☐

AVERAGE OPACITY FOR HIGHEST PERIOD: 0

NUMBER OF READINGS ABOVE 20 % WERE: 0

COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE

DATE

OBSERVER'S NAME: Johnny Skinner

OBSERVER'S SIGNATURE: Johnny Skinner — DATE: 7/21/05

ORGANIZATION: ES&H - Clean Air Program — CERTIFICATION EXPIRATION DATE: 10-11-05

VERIFIED BY: W.D. Northcutt — DATE: 7/21/05

CN-0641 Original – File Canary - Facility RDA – 1298

VISIBLE EMISSION OBSERVATION FORM

SOURCE NAME	BWXT Y-12 L.L.C.
OBSERVATION DATE	7/20/2005
START TIME	12:05
STOP TIME	12:35
ADDRESS	Post Office Box 2001
	Stack 432
CITY	Oak Ridge
STATE	Tenn
ZIP	37831
PHONE	576-7586
SOURCE ID NUMBER	01-0020 & 01-1020
PROCESS EQUIPMENT	Muffle Furnaces
OPERATING MODE	In Service
CONTROL EQUIPMENT	Distillate Pot
OPERATING MODE	Full Capacity
DESCRIBE EMISSION POINT	Location per roof diagram for Building 9212
START	
STOP	Same
HEIGHT ABOVE GROUND LEVEL START	76'
HEIGHT ABOVE GROUND LEVEL STOP	Same
HEIGHT RELATIVE TO OBSERVER START	47'
HEIGHT RELATIVE TO OBSERVER STOP	Same
DISTANCE FROM OBSERVER START	60'
DISTANCE FROM OBSERVER STOP	Same
DIRECTION FROM OBSERVER START	SW
DIRECTION FROM OBSERVER STOP	Same
DESCRIBE VISIBLE EMISSIONS START	No visible emissions observed
STOP	
EMISSION COLOR START	Clear
EMISSION COLOR STOP	Same
IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	N/A
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START	N/A
STOP	N/A
DESCRIBE PLUME BACKGROUND START	Clear Blue Sky
STOP	Same
BACKGROUND COLOR START	Sky Blue
BACKGROUND COLOR STOP	Same
SKY CONDITIONS START	Clear
SKY CONDITIONS STOP	Same
WIND SPEED START	1.2 mph
WIND SPEED STOP	Same
WIND DIRECTION START	N
WIND DIRECTION STOP	Same
AMBIENT TEMP. START	83°F
AMBIENT TEMP. STOP	Same
WET BULB TEMP.	N/A
RH, percent	N/A

MIN \ SEC	0	15	30	45	COMMENTS
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
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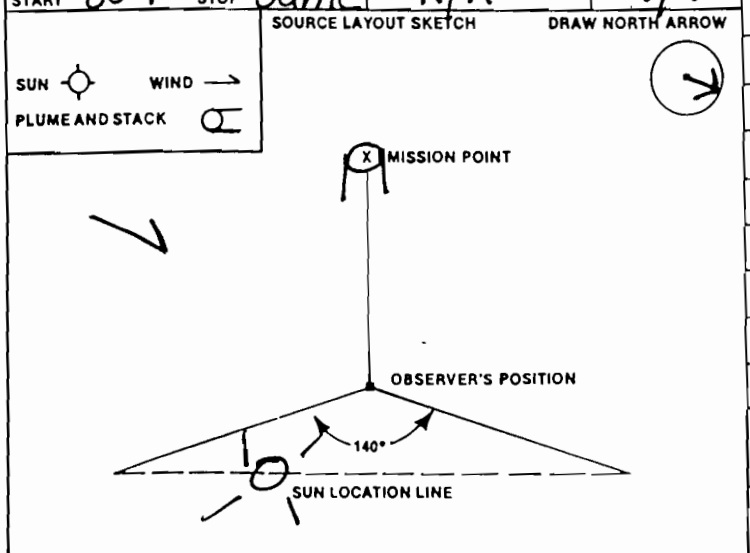
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



APPLICABLE OPACITY STANDARD	20 % OPACITY
EPA METHOD 9	X
TVEE METHOD 1	☐
TVEE METHOD 2	
TVEE METHOD 3	☐
AVERAGE OPACITY FOR HIGHEST PERIOD	0
NUMBER OF READING ABOVE %	20
WERE	0
COMMENTS	
OBSERVER'S NAME (PRINT)	Gary Seeber
OBSERVER'S SIGNATURE	Gary Seeber
DATE	7/19/2005
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS	
SIGNATURE	
ORGANIZATION	Environment, Safety, & Health
CERTIFICATION EXPIRATION DATE	10/15/05
TITLE	
DATE	
VERIFIED BY	Johnny Skinner
DATE	7/19/2005

PATR 0101

PH-2534
APC REV. 8/88

Department of Energy

Oak Ridge Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

June 23, 2008

Mr. Barry R. Stephens, Technical Secretary
Division of Air Pollution Control
Tennessee Department of Environment and Conservation
9th Floor Annex Building
401 Church Street
Nashville, Tennessee 37243-1531

Dear Mr. Stephens:

CALENDAR YEAR 2007 RADIONUCLIDE NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS REPORT FOR THE DEPARTMENT OF ENERGY OAK RIDGE RESERVATION

Enclosed pursuant to 40 CFR 61.94 is the *Calendar Year 2007 Radionuclide National Emission Standards for Hazardous Air Pollutants (Radionuclide NESHAP) Report for the Department of Energy Oak Ridge Reservation.*

If you have any questions, or need additional information, please contact me at (865) 576-4444 or M. P. Humphreys, of my staff, at (865) 576-4307.

Sincerely,

Gerald G. Boyd
Manager

Enclosure

cc w/enclosure:
L. E. Nanney, TDEC
V. Malichis, TDEC Knoxville Field Office
D. Hopkins, EPA-IV
D. R. Allen, SE-32
L. C. Kelly, SE-30
J. O. Moore, LM-10
S. H. McCracken, EM-90
J. A. Owsley, TDEC-DOE
L. W. Clark, NS-50
R. J. Brown, M-2
T. D. Sherry, NADP-6
J. M. Eaton, 9115, MS 8219, BWXT Y-12
J. M. Wolfe, MS 6049, ORNL
D. A. Poole, MS 7314, ETTP

Department of Energy
Air Emissions Annual Report
40 Code of Federal Regulations (CFR) 61.94, Subpart H
Calendar Year 2007

Site Name: **Oak Ridge Reservation**

Field Office Information

Office: Department of Energy, Oak Ridge Operations

Address: Post Office Box 2001
Oak Ridge, Tennessee 37831

Contact: David R. Allen Phone: (865) 576-0411

Site Information

Site: East Tennessee Technology Park

Operating Contractor: Bechtel Jacobs Company LLC

Address: Post Office Box 4699
Oak Ridge, Tennessee 37831-7171

Contact : Tony Poole Phone: (865) 241-3591

Site: Y-12 National Security Complex

Operating Contractor: Babcock & Wilcox Technical Services Y-12, L.L.C. (B&W Y-12)

Address: Post Office Box 2009
Oak Ridge, Tennessee 37831-8239

Contact: Owen D. Stevens Phone: (865) 576-9657

Site: Oak Ridge National Laboratory

Operating Contractor: UT-Battelle, LLC

Address: Post Office Box 2008
Oak Ridge, Tennessee 37831-6395

Contact: David Skipper Phone: (865) 576-5748

SECTION I. FACILITY INFORMATION

SITE DESCRIPTION: OAK RIDGE RESERVATION

The Oak Ridge Reservation (ORR) is located within the corporate limits of the city of Oak Ridge in eastern Tennessee and consists of approximately 34,241 acres of federally owned land. The ORR site is predominantly to the west and south of the city of Oak Ridge, which has a population of 27,310. Oak Ridge lies in a valley between the Cumberland and southern Appalachian mountain ranges and is bordered on one side by the Clinch River. The Cumberlands are about 16 km (10 miles) northwest; 113 km (70 miles) to the southeast are the Great Smoky Mountains. Figure 1 is a map of the ORR.

Except for the city of Oak Ridge, the land within 8 km (5 miles) of the ORR is predominantly rural, used largely for residences, small farms, and cattle pasture. Fishing, boating, water skiing, and swimming are recreational activities in the area. The approximate location and population of the towns nearest the ORR are Oliver Springs (population 3,303), 11 km (6.8 miles) to the northwest; Clinton (population 9,409), 16 km (10 miles) to the northeast; Lenoir City (population 6,819), 11 km (6.8 miles) to the southwest; and Harriman (population 6,744), 13 km (8 miles) to the west.[1] Figure 2 provides a map of the nearby towns and cities. Knoxville, the major metropolitan area nearest Oak Ridge, is located about 20 km (12 miles) to the east and has a population of approximately 173,890.[1] Oak Ridge has a temperate climate of warm, humid summers and cool winters. Spring and fall are usually long. During spring, storm systems bearing significant precipitation frequent the area, but the fall is normally sunny with mild temperatures. Severe storms, such as tornadoes or high-velocity winds, are rare. Oak Ridge is one of the country's calmest wind areas. The daily up-and-down valley winds, however, provide some diurnal exchange. The prevailing winds are northeasterly (down-valley) and southwesterly (up-valley).

During 1991 and 1992, the Department of Energy (DOE) Oak Ridge Operations (ORO) Office and the Environmental Protection Agency (EPA) Region 4 negotiated a Federal Facilities Compliance Agreement (FFCA), which was used to bring the ORO into full compliance with 40 CFR 61, Subpart H. As required by the FFCA, the *Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee* (*Compliance Plan*), was submitted to EPA Region 4 in December 1991. ORO completed all other obligations under the compliance schedule of the FFCA by December 15, 1992. In September 1993, EPA Region 4 conducted an inspection of the ORR to verify that all requirements of the FFCA were completed. All requirements were found to have been satisfactorily completed, and no deficiencies were noted. In May 1994, the *Compliance Plan* was updated to reflect additional agreements between EPA Region 4 and ORO since the original *Compliance Plan* was submitted in 1991.

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[1]Population data cited here is the 2000 decennial census data reported by the U.S. Census Bureau (www.census.gov).

ORNL-DWG 93M-9616R4

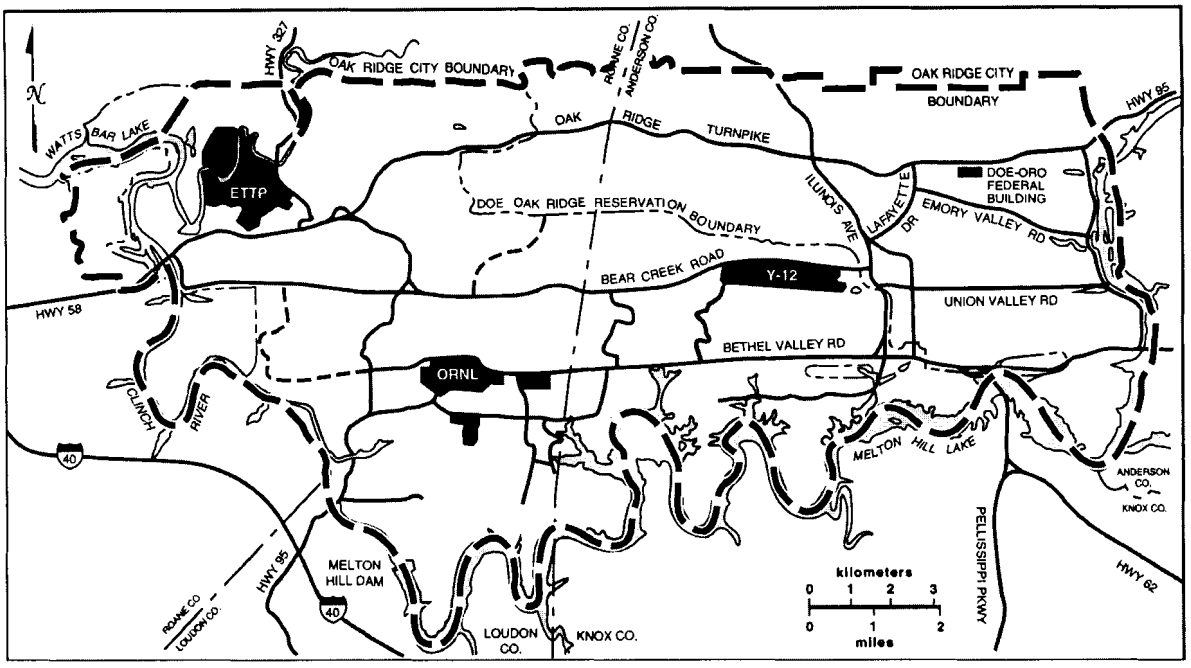

Fig. 1: Map of the ORR

ORNL-DWG 87M-7054R5

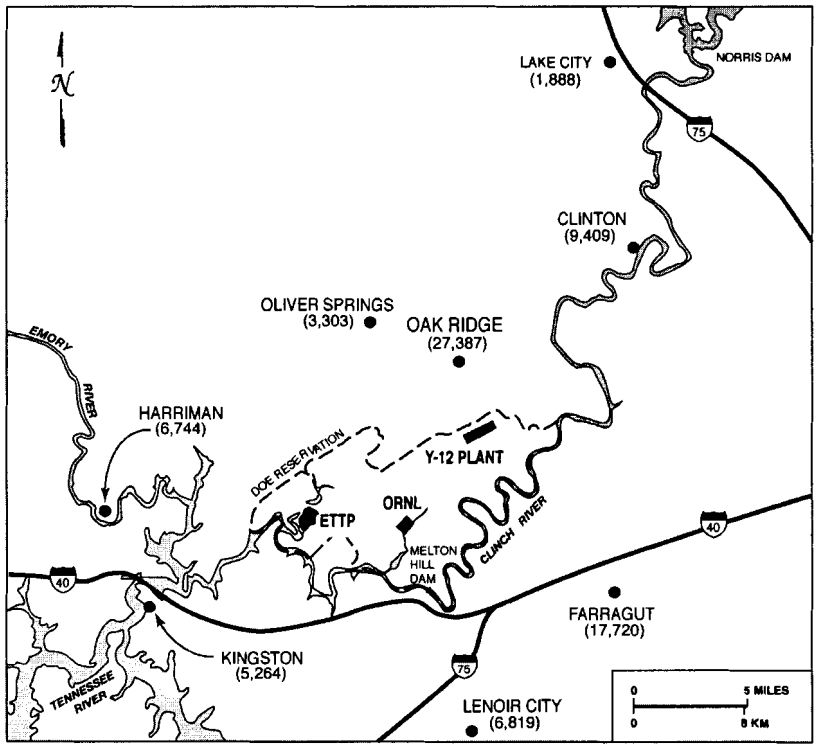

Fig. 2: Location of towns and cities near the ORR

In October 2001, EPA Region 4 approved two addendums to the *Compliance Plan*, Addendum C.1, *Monitoring for Fugitive and Diffuse Sources* and Addendum C.2, *Monitoring Plan for On-Site Receptors*. Addendum C.1 formalizes the use of environmental measurements from ambient air monitoring to confirm compliance for fugitive and diffuse sources for the ORR. This compliance approach has been in place since January 1993, and ambient air monitoring results have been included in the ORR Annual Air Emissions Report since the monitoring was implemented in 1993. Addendum C.2 formalizes EPA guidance, in a February 1, 2001, guidance letter, that allows the use of environmental measurements from ambient air monitors in lieu of continuous stack monitoring as an alternative method to demonstrate compliance with 40 CFR 61, Subpart H, for sources that are major when modeled to "onsite" receptors, but minor when modeled to offsite receptors. Ambient air monitoring results for these sources have been included in the ORR Air Emissions Annual Report since the 2002 report. In March 2005, EPA Region 4 approved a third addendum to the *Compliance Plan*, Addendum C.3 ANSI/HPS N13.1-1999 Upgrade Policy, which clarifies when an existing source on the ORR undergoing a modification must be upgraded to meet the new design criteria of the ANSI/HPS N13.1-1999 Standard in accordance with the September 9, 2002, amendment to 40 CFR 61, Subpart H. During the March 2005 approval cycle, the title page to the *Compliance Plan* was updated with a DOE document number (DOE/ORO/2196) and a revision to Section 2.1 was approved that incorporated updated criteria under 10 CFR Part 835.

SOURCE DESCRIPTION: Y-12 NATIONAL SECURITY COMPLEX

Y-12 National Security Complex (Y-12 Complex) is located in a valley immediately adjacent to the city of Oak Ridge, but separated from it by a 300-foot high ridge. It is managed and operated by Babcock and Wilcox Technical Services Y-12, L.L.C. (B&W Y-12). The Y-12 Complex's mission is to meet the needs of DOE, other government agencies, and private industry through a commitment to excellence in the utilization of a technology-based manufacturing center. This mission includes:

- Production of complex components and assemblies
- Safe and secure storage of nuclear materials
- Dismantlement, disposition, evaluation, and assessment of weapon components
- Transitioning the Y-12 Complex size to meet DOE needs
- Transfer of technology to private industry
- Maintenance of DOE capabilities
- Support of other national priorities

This mission will be accomplished in a cost-effective manner by integrating manufacturing, engineering, and development technologies, with emphasis on protecting the environment, and the health and safety risks of the public and employees.

The major radionuclide emissions contributing to the dose from the Y-12 Complex are nuclides ^{234}U, ^{235}U, ^{236}U, and ^{238}U, which are emitted as particulates. The particle size and solubility class

of the emissions are based on review of the operations and processes served by the exhaust systems to determine the quantity of uranium handled in the operation or process, the physical form of the uranium, and the nature of the operation or process. The four categories of processes or operations that are considered in the total of uranium emissions are those that exhaust through monitored stacks, unmonitored processes for which Appendix D calculations are performed, processes or operations exhausting through laboratory hoods also involving Appendix D calculations, and processes from room exhausts monitored by radiation control equipment.

Continuous sampling systems are used to monitor emissions from a number of process exhaust stacks at the Y-12 Complex. In addition, a probe-cleaning program is in place, and the results from the probe cleaning at each source are incorporated into the respective emission point source term. In 2007, a total of 43 process exhaust stacks were continuously monitored, 36 of which were major stacks and the remaining 7 being minor stacks. These monitored emission points are listed separately as major and minor point sources in Section II. It is noted that the sampling systems on these stacks have been approved by EPA Region 4.

During the calendar year (CY) 2007, unmonitored uranium emissions at the Y-12 Complex occurred from 43 emission points associated with onsite, unmonitored processes and laboratories operated by B&W Y-12. Emission estimates for the unmonitored process and laboratory stacks were made using inventory data with emission factors provided in 40 CFR 61, Appendix D. These emission points are listed as two minor grouped sources in Section II. The Y-12 Complex source term includes an estimate of these unmonitored emissions.

In 1996, an Analytical Chemistry Organization laboratory was relocated from the Y-12 Complex to an offsite location approximately 0.3 miles east of the Y-12 Complex on Union Valley Road. The laboratory is operated by B&W Y-12 in a leased facility that is not within the ORR boundary. In 2007, there were no emission points (or sources) in this facility.

Additionally, estimates from room ventilation systems are considered using radiological control data on airborne radioactivity concentrations in the work areas. Where applicable, exhausts from any area where the monthly concentration average exceeds 10 percent of the derived air concentration (DAC) (as defined in the *Compliance Plan)* are included in the annual source term. Annual average concentrations and design ventilation rates are used to arrive at the annual emission estimate for these areas. Six emission points from room ventilation exhausts were identified in 2007 where emissions exceeded 10 percent of the DAC. Five of these emission points fed to monitored stacks and any rad emissions are accounted for as noted above for monitored emission points. The sixth emission point resulted from an unplanned release and is characterized in the Section II table as a minor source.

A construction permit was issued by the state in November 1998 for Y-9998-F-143, a new 3500-ton press in Building 9998. This source was designed and equipped with a stack monitor prior to the effective date of the September 9, 2002, final amendment to 40 CFR 61, Subpart H, which incorporated the use of the ANSI/HPS N13.1-1999 standard. It will be reported in Section II as a monitored, major point source when it becomes operational.

Lastly, the Y-12 Complex was issued the Title V Major Source Operating Permits 554701 and 554594 in 2004. These permits required compliance implementation beginning April 1, 2005. Contained in the permits was a site-wide, streamlined alternate emission limit for enriched and depleted uranium process emission units. A limit of 2,000 pounds per year of particulate was set for these sources for the purposes of paying fees. The compliance method defined for Permit 554701, Condition E3, and Permit 554594, Condition E4, requires the annual actual mass emission particulate emissions to be generated using the same monitoring methodologies required for Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAPs) compliance. In 2007, the total mass radionuclide emission from the Y-12 Complex was less than 2000 grams. This value is multiplied by two to conservatively estimate total particulate emissions from these sources (radionuclide + non-radionuclide particulate emissions). Therefore, in 2007 the total particulate emission from these sources was less than 4000 grams (<10 lb) which is less than the 2,000-pound permit limit.

SOURCE DESCRIPTION: OAK RIDGE NATIONAL LABORATORY

Oak Ridge National Laboratory (ORNL), operated by UT-Battelle, LLC, located toward the west end of Bethel Valley, is a large, multipurpose research laboratory whose overall mission is to expand knowledge, both basic and applied, in areas related to energy.

ORNL's mission is to support DOE in four broad areas:

- Science and technology
- Energy resources
- Environmental quality
- National security

ORNL conducts research and development (R&D) in areas of science and technology. ORNL's facilities include a nuclear reactor, chemical pilot plants, research laboratories, radioisotope production laboratories, accelerators, fusion test devices, and support facilities. Bechtel Jacobs Company LLC (Bechtel Jacobs) assumed operation of some waste management facilities and clean-up of facilities slated for environmental restoration or decommissioning at ORNL in 1998. These facilities are included in Section II and have a Bechtel Jacobs designation.

Radionuclide emissions at ORNL vary because of the diverse range of research activities performed. Sources of radionuclide emissions consist mainly of ventilation from (1) isotope production/handling areas, (2) reactor research, (3) analytical facilities, (4) small, bench-scale experiments, and (5) out-of-service and decommissioned facilities. These emissions typically consist of particulates, adsorbable gases, nonadsorbable gases (i.e., noble gases), and tritium. The major contributor to the offsite dose at ORNL historically has been ^{41}Ar, which is emitted as a nonadsorbable gas from the 7911 Melton Valley complex stack. Emissions of ^{41}Ar result from High Flux Isotope Reactor (HFIR) operations and research activities. However, from 2001-2006, ^{138}Cs became the major contributor to the offsite ORNL plant dose since HFIR was down

due to an extended maintenance period and the installation of the Cold Neutron Source. Emissions of ^{138}Cs result from research activities in the Radiochemical Engineering Development Center which also exhaust through the 7911 Melton Valley complex stack. In 2007, HFIR was in full operation completing several operating cycles which resulted in ^{41}Ar once again becoming the major offsite dose contributor to the ORNL plant dose (approximately 49 percent). Cesium-138 contributed approximately 21 percent of the ORNL plant dose. As the radiological areas change, other areas are remediated, and research activities change, the number of emission points in some of the minor source groupings (e.g., laboratory hoods) will be modified.

In 2006, construction of the Spallation Neutron Source (SNS) project was completed. The purpose of the project was to design, construct, and commission into operation an accelerator-based, pulsed neutron facility for studies of the structure and dynamics of materials. In December 2007, commencement of User Operation for beamlines was authorized. Emissions from pre-start activities conducted in 2007 are included in this report. Radionuclide emissions from the SNS are discharged through a single emission point, the SNS Central Exhaust Facility stack (8915). The SNS Central Exhaust Facility stack has the potential to emit radionuclides that would result in a dose equal to or greater than 0.1 mrem/year (0.001 mSv/year) to the most exposed member of the public and, therefore, continuous emission sampling or monitoring is required. This requirement is met with an in-stack radiation detector that monitors radioactive gases flowing through the exhaust stack and provides a continual readout of detected activity using a scintillator probe. The detector is calibrated to correlate with isotopic emissions.

The source term information from the ORNL site is obtained from seven major and a number of minor emission sources. During 2007, nine sources at ORNL were continuously monitored (Emission Sources 2026, 3020, 3039, 7503, 7830, 7856, 7880, 7911, and 8915 SNS Central Exhaust Stack). The 3039 Central Off-gas System operations, the 7503 Molten Salt Reactor facility, the 7830 Melton Valley Storage Tanks, and the 7856 Melton Valley Storage Tanks Capacity Increase Project are operated by Bechtel Jacobs. The TRU Waste Processing Center (7880) is operated by EnergX TN, LLC[2] that started processing low level liquid waste in 2004. Currently, EnergX TN, LLC is processing both contact handled (CH) and remote handled (RH) transuranic (TRU) debris waste for final disposal. In February 2007, Isotek, LLC, assumed operation of the 3020 Radiochemical Development Facility. Emissions from the stacks were quantified using continuous sampling systems. In addition, a probe-cleaning program is in place for all of these stacks except for 8915, and any measurable or statistically significant results from the probe cleaning at each source are incorporated into the respective emission point's source term. A probe cleaning program has not been determined necessary for 8915 since the sample probe is a scintillator probe used to detect radiation and not to extract a sample of stack exhaust emissions. It is not anticipated that contaminant deposits would collect on the scintillator probe. All systems meet the criteria for 40 CFR 61 Subpart H. Seven sources (2026, 3020, 3039, 7503,

[2]During 2006, the TRU Waste Processing Center contract was converted from a fixed price to a cost reimbursable contract with EnergX TN, LLC as the operating subcontractor. EnergX TN, LLC became the prime contractor to DOE in January 2008 when the Foster Wheeler Environmental Corporation contract was novated to EnergX TN, LLC.

7880, 7911, and 8915) have the potential to emit radionuclides that would result in a dose equal to or greater than 0.1 mrem/year (0.001 mSv/year) to the most exposed member of the public and require continuous emission sampling. The other continuously sampled sources have a potential dose below 0.1 mrem/year (0.001 mSv/year). However, due to the nature of the operations at these facilities, the potential dose can shift upward, placing the facility into the "major source" category. Data from the continuous samplers indicated that the actual potential dose did not exceed the 0.1 mrem/year (0.001 mSv/year), and the sources were categorized as minor sources.

A total of 15 minor sources (point and grouped) are located at ORNL. Minor sources do not have the potential to cause any member of the public to receive an effective dose (ED) equal to or greater than 0.1 mrem/year (0.001 mSv/year). Two of the minor sources have emissions from inoperative facilities that are still vented to the atmosphere. These are the Graphite Reactor (3018) and out-of-service laboratory hoods and/or facilities with residual contamination. There are thirteen minor sources venting from operational areas. These sources are the Decontamination Laundry (2523), Interim Manipulator Repair Facility (3074), Process Waste Treatment Plant (3544), Transuranium Research Laboratory (5505), Liquid Low Level Waste (LLW) Solidification Facility (7877), Sewage Treatment Plant (STP) Sludge Drier, Nonradiological Wastewater Treatment Facility (3608 Air Stripper and the 3608 Filter Press), Storage Tanks (2099, 7830, 7856, 7966), and laboratory hoods. A variety of approved methods are used to evaluate minor source emissions, including in-stack sampling, health physics data, high-efficiency particulate air (HEPA) filter sampling, surrogate emission estimates, and inventory data with emission factors provided in 40 CFR 61, Appendix D.

During 2007, no new sources operated by Bechtel Jacobs were added to the ORNL source term and two were removed. The removed sources, for which remediation was completed in 2006, were: SWSA-5 Trench Contaminated Container Removal and Remediation; and the Soils and Sediment Pipe Cutting activities.

EPA Headquarters issued guidance to the EPA Regional Offices February 1, 2001, allowing the use of environmental measurements from high-volume air samplers in lieu of continuous stack monitoring as an alternative method to demonstrate compliance with 40 CFR 61, Subpart H, for DOE's "privatization/reindustrialization" program. In a series of telephone conversations between DOE-ORO and the Tennessee Department of Environment and Conservation (TDEC), it was determined that the construction workers that support construction activities for ORNL's Facilities Revitalization Project would be considered members of the public subject to 40 CFR 61, Subpart H, compliance, since the proposed construction sites were deeded to a non-DOE entity. In light of the February 1, 2001, guidance from EPA, UT-Battelle and DOE requested and obtained approval from EPA Region 4 to use a single transportable high-volume air sampler at the East Campus construction site as an alternative method to demonstrate compliance with 40 CFR 61, Subpart H, due to the transient nature of the construction work force. In October 2001, EPA Region 4 approved Addendum C.2, *Monitoring Plan for On-Site Receptors,* to the *Compliance Plan* which formalizes EPA's February 1, 2001, guidance and allows the use of a single transportable high-volume air sampler at any construction site where the workers are considered members of the public subject to 40 CFR 61, Subpart H. In 2007, three such samplers were used at ORNL construction sites. Ambient air concentration dose assessment

results are included in Section III.

ERRATUM: In 2006, 7880 was mistakenly listed as a minor source. Even though 7880's actual dose contribution to the ORR's most exposed individual was reported correctly, its potential dose was greater than 0.1 mrem/year (0.001 mSv/year) for 2006. Annual emissions have been determined through the use of a continuous in-stack sampling system since its inception in January 2004. An operating permit was issued April 13, 2004, under Emission Source Reference Number 73-0165-01. This source was permitted as a major source under 40 CFR 61, Subpart H and will be reported as a major source in this and all future reports.

SOURCE DESCRIPTION: EAST TENNESSEE TECHNOLOGY PARK

The East Tennessee Technology Park (ETTP) is located on Highway 58 near the intersection of the Clinch River and Poplar Creek. The primary mission at the ETTP is to perform environmental management activities including site remediation, decontamination and decommissioning (D&D), and waste treatment operations, as well as to establish a private-sector mixed-use business and industrial park under DOE's Reindustrialization Program. Major activities at ETTP resulting in airborne radionuclide emissions to the environment are: (1) provide waste handling, storage, and treatment capabilities including the Toxic Substances Control Act (TSCA) Incinerator; (2) conduct D&D activities; and (3) conduct site remediation activities.

One method to help accelerate clean-up of the site is via DOE's Reindustrialization Program that leverages the site's underutilized facilities and equipment to attract private businesses to the area. Titles to various buildings and land parcels at ETTP have been transferred, and several other properties are leased. Those companies that locate on site assume the cost of utilities and surveillance and maintenance, freeing up additional funding for DOE. In addition, once title to a facility has been transferred, it is the property owner's responsibility to demolish the building instead of DOE's. At the close of CY 2007, there were approximately 20 private companies occupying space at ETTP.

In accordance with the February 2001 EPA Memorandum entitled "Criteria to Determine Whether a Leased Facility at DOE is Subject to Subpart H," from Frank Marcinowski, EPA Headquarters, to all EPA Regional Offices, EPA has established specific criteria for assessing onsite receptor locations with respect to the definition of "public" in conformance with the Radionuclide NESHAPs regulations. These criteria require that employees of a non-DOE entity must be considered members of the public in the Subpart H dose assessment if they do not wear DOE access security badges and there are no DOE security controls, such as a fence that is locked and has an established checkpoint (DOE badge reader or guard) through which the employees must enter. Even if lessees at ETTP wear DOE-issued badges, some are considered "members of the public" because DOE managed site access security controls are not in place at certain lessee business locations.

For CY 2007, DOE assessed the dose from DOE airborne radionuclide emissions to non-DOE

businesses located on the ORR where access is not restricted in the manner described above. This assessment does not include emissions from lessees operating under separate Nuclear Regulatory Commission or Agreement State Radiological License. Specifically, dose was assessed to members of the public permitted unrestricted access to the following locations adjacent to and within the ETTP: ED-1 site located east-north-east of the ETTP site (also known as the Horizon Center), ETTP Building K-1007 Cafeteria, ETTP Building K-1035, ETTP Building K-1036, ETTP Building K-1400, Rarity Ridge real estate development community located southwest of the ETTP, and the Tennessee Valley Authority Roane Substation on Blair Road north of the ETTP. Non-DOE workers having unrestricted access to the ETTP site as their place of employment are considered dose receptors under the Radionuclide NESHAPs regulations and subsequently are now subject to inclusion in the CY 2007 ORR dose assessment.

Airborne radionuclide source-term information for ETTP release points was obtained using a variety of methods ranging from continuous sampling, as required by the regulation, to other methods outlined in the *Compliance Plan* and subsequent correspondence between EPA and ORO. All listed radiological sources were operated under the responsibility of Bechtel Jacobs.

Two major sources operated at ETTP during this reporting period. Radiological emissions from the K-1435 TSCA Incinerator (TSCAI) are measured using a continuous stack sampling system. The design and operation of this sampling system meets specified criteria in 40 CFR 61 Subpart H. Sample collection procedures include a probe cleaning program, and the results from the probe cleaning are incorporated into the emission source term. The K-1423 Solid Waste Repacking Facility was previously reported as a minor source, but is now identified as a major source due to potential emissions impact to a designated onsite member of the public location. This source remains minor to the most impacted offsite receptor. Addendum C.2 of the *Compliance Plan* was exercised allowing the use of environmental measurements from ambient air monitors in lieu of continuous stack monitoring as an alternative method to demonstrate compliance with 40 CFR 61, Subpart H, for sources that are major when modeled to "onsite" receptors, but minor when modeled to offsite receptors.

Emissions from four minor sources located at ETTP were estimated during 2007 using one of the following methods: (1) radionuclide inventory (e.g., material balance), (2) health physics air data and building ventilation rate information, (3) surrogate emissions, (4) evaporative tank emissions, and (5) methods outlined in Appendix D to 40 CFR 61. The one grouped source is the K-1435-C Waste Feed Tanks (15 vents). The remaining three minor sources are the K-1407-U Central Neutralization Facility air stripper, the TSCAI Waste Water Treatment Facility (WWTF) Sludge Press, and the K-25 Segmentation Shop 18A. The WTTF was built and operated briefly during 2007. The following minor source did not operate during 2007: the K-1423 Container Processing Facility. The following sources did not operate during 2007 and were permanently removed from service: K-1004-L Decontamination and Demolition, K-1066-K IES Cylinder Venting, and K-1420 Solid Waste Repack Operation.

SOURCE DESCRIPTION: OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION

In addition to operations at the three major installations, ORO is responsible for facilities at the Oak Ridge Institute of Science and Education (ORISE), which handles extremely small quantities of radionuclides for research and training purposes. As indicated in the *Compliance Plan*, compliance with 40 CFR 61, Subpart H, is demonstrated by use of annual possession quantities. Quantities of radionuclides handled at ORISE are well below the annual possession quantities for environmental compliance listed in Appendix E, Table 1 of 40 CFR 61. Therefore, emission estimates from the ORISE operations are not included in this report.

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – Y-12

Sources[a]	Type of Control[b]	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Honey - H Vegetable-V
Major Point Sources									
Central Stack[c]	N/A	N/A	20	NA	NA	Ambient	770-R	2310	4870-H
1	HEPA[d] Filter	99.95				Ambient			
3	Prefilter HEPA Filter	95 99.95				Ambient			
4	Prefilter HEPA Filter	95 99.95				Ambient			
6	Fabric Filter	65				Ambient			
7	No Controls	N/A				Ambient			
11	No Controls	N/A				Ambient			
12[e]	HEPA Filter	99.95				Ambient			
13	Prefilter HEPA Filter	95 99.95				Ambient			
14	HEPA Filter	99.95				Ambient			
15	Prefilter HEPA Filter	95 99.95				Ambient			
26	Prefilter HEPA Filter	95 99.95				Ambient			
27	Cyclone Filter HEPA Filter	50 99.95				Ambient			
28	Roughing Prefilter HEPA Filter	80 95 99.95				Ambient			
33	Roughing Prefilter HEPA Filter	80 95 99.95				Ambient			
38	Prefilter HEPA Filter	95 99.95				Ambient			

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – Y-12

Sources[a]	Type of Control[b]	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Honey - H Vegetable-V
40	HEPA Filter	99.95				Ambient			
43	Rouging HEPA Filter	80 99.95				Ambient			
44	No Controls	N/A				Ambient			
45	Prefilter HEPA Filter	95 99.95				Ambient			
47	No Controls	N/A				Ambient			
48	Prefilter HEPA Filter	95 99.95				Ambient			
60	Prefilter HEPA Filter	95 99.95				Ambient			
61	Baghouse Fabric Filter	85 90				Ambient			
67	Baghouse HEPA Filter	90 99.95				Ambient			
75	Prefilter HEPA Filter	95 99.95				Ambient			
76	Bag Filter Prefilter HEPA Filter	85 95 99.95				Ambient			
85[e]	B-2000 Filter HEPA Filter	90 65				Ambient			
87[e]	No Controls	N/A				Ambient			
88[e]	Baghouse HEPA Filter	85 99.95				Ambient			
101	HEPA Filter	99.95				Ambient			
104	HEPA Filter	99.95				Ambient			
105	HEPA Filter	99.95				Ambient			

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – Y-12

Sources[a]	Type of Control[b]	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Honey - H Vegetable-V
106	HEPA Filter	99.95				Ambient			
107	HEPA Filter	99.95				Ambient			
109	Prefilter HEPA Filter	55 99.95				Ambient			
110	Prefilter HEPA Filter	55 99.95				Ambient			
112	Primary Secondary Scrubber	50 50 99				Ambient			
113	No Controls	N/A				Ambient			
114	HEPA Filter	99.95				Ambient			
134	Prefilter HEPA Filter Scrubber	60 99.95 99				Ambient			
Minor Point Sources									
7 Remaining Monitored Stacks[f]	Demister Prefilter B-2000 HEPA Filter	60 65-80 95 99.95	20	NA	NA	Ambient	770-R	2310	4870-H
Unplanned Release (1 building, 1 emission point)	None	NA	20	0.5	NA	Ambient	770-R	2310	4870-H

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – Y-12

Sources[a]	Type of Control[b]	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Honey - H Vegetable-V
Minor Grouped Sources[g]									
Unmonitored Process Stacks* (8 buildings, 13 emission points)	11 None 2 HEPA Filter	NA 99.95	20	0.5	NA	Ambient	770-R	2310	4870-H
Unmonitored Laboratory Exhausts* (2 buildings, 30 emission points)	28 None 2 HEPA Filter	NA 99.95	20	0.5	NA	Ambient	770-R	2310	4870-H

[a] The point source number corresponds to the stack radiological monitoring program number.

[b] Some control devices are final controls that serve all processes exhausted to the stack, while other control devices serve individual processes. Not all stacks have a final control device.

[c] Based on guidance from EPA Region 4 (letter from Charles R. Phillips to B. J. Davis, dated January 25, 1985), and as stated in *Compliance Plan* DOE/ORO/2196 revised March 30, 2005, all Y-12 National Security Complex emissions are assumed to come from a single central stack for modeling purposes. A study has been conducted to show that this assumption results in an overestimate of the dose resulting from Y-12 National Security Complex emissions.

[d] High-efficiency particulate air filter.

[e] This stack is temporarily shut down. The process served by this stack is on stand-down status.

[f] Some of these monitored stacks have no emission control. Other stacks have emission control ranging from cyclones to HEPA filtration. The different types of control devices that may be found on these stacks have been listed with their estimated control efficiency.

[g] An asterisk (*) indicates points where the source term is estimated entirely by calculations without any monitoring or sampling data (e.g., Appendix D of 40 CFR 61).

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – ORNL

Sources	Type of Control	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Vegetable - V
Major Point Sources									
X-2026	HEPA Filters[a], Charcoal Filter	99 90[b]	22.9	1.05	9.96	Ambient	220-B	220	4030-B
X-3020 (Isotek)[f]	HEPA Filters[a]	99	61	1.22	15.03	Ambient	380-B	380	4230-B
X-3039 (Bechtel Jacobs)	HEPA Filters[a] Venturi Scrubber	99 98	76.2	2.44	13.28	Ambient	450-B	520	4150-B
X-7503 (Bechtel Jacobs)	HEPA Filters Charcoal Filter	99 90	30.5	0.91	11.34	Ambient	1340-B	4290	4100-B
X-7880 (EnergX TN, LLC)	HEPA Filter	99.97	27.43	1.52	14.16	Ambient	1740-B	4040	2720-B
X-7911	HEPA Filters[a] Packed Bed Scrubber Charcoal Bed	99 90[c] 99.98[d]	76.2	1.52	12.81	Ambient	1630-B	4260	3910-B
X-8915	HEPA Filters[a] Charcoal Bed[e]	99 99.9	24.38	1.22	5.67	Ambient	2220-R	5350	6470-B
Minor Point Sources									
X-2099 (Bechtel Jacobs)	HEPA Filter	99	3.66	0.18	22.07	Ambient	220-B	220	4030-B
X-3018 (Bechtel Jacobs)	HEPA Filter	99	61.0	4.11	0.23	Ambient	380-B	380	4230-B
X-3074	HEPA Filter	99	4.1	0.25	10.69	Ambient	380-B	0[j]	4230-B
X-3544 (Bechtel Jacobs)	HEPA Filter	99	9.53	0.28	6.16	Ambient	460-B	460	3850-B
X-3608 Air Stripper (Bechtel Jacobs)	None	N/A	10.97	2.44	0.57	Ambient	580-B	580	3900-B
X-3608 Filter Press (Bechtel Jacobs)	HEPA Filter	99	8.99	0.36	9.27	Ambient	580-B	0	3900-B
X-7856 (Bechtel Jacobs)	HEPA Filter	99	18.29	0.48	12.49	Ambient	1740-B	4040	2720-B
X-7877 (Bechtel Jacobs)	HEPA Filter	99	13.9	0.41	13.56	Ambient	1740-B	4040	2720-B
X-7966 (Bechtel Jacobs)	HEPA Filter	99	6.10	0.29	10.11	Ambient	1630-B	3680	3910-B
X-STP Sludge Drier	HEPA Filter	99	7.6	0.20	10.21	Ambient	330-B	330	3700-B

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – ORNL

Sources		Type of Control	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
								Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Vegetable - V
Minor Grouped Sources										
X-2523 (2 emission points)		HEPA Filter	99	7	0.30	8.33	Ambient	240-B	240	3780-B
X-5505 (3 emission points)	N and S Duct	HEPA Filter	99	11	0.96	16.79	Ambient	410-B	1230	4530-B
	Main Duct			11	0.30	2.40			0	
X-7830 (Bechtel Jacobs) (2 emission points)		HEPA Filter	99	4.6	0.25	8.35	Ambient	1740-B	2480	2720-B
X-Laboratory Hoods[g] (UT-Battelle and Bechtel Jacobs) (40 points, venting approximately 66 sources)		None[h] HEPA Filter, Roughing Filter	NA 99 80	15	NA	NA	Ambient	70-B	0 (1000)[i] 580 (2000/3000) 980 (4000) 490 (6000) 1540 (7000)	3540 –B (1000)[i] 4120-B (2000/3000) 4380-B (4000) 4960-B (6000) 3900-B (7000)
Out of service Laboratory Hoods (UT-Battelle and Bechtel Jacobs) (130 emission points venting 156 sources)		None HEPA Filter	NA 99	15	NA	NA	Ambient	450-B	620	4150-B

[a] In addition to HEPA filters, other filters are also located at some of the individual sources within buildings. Filter efficiencies at individual sources range from 90 to 99.95 percent.

[b] Assumed efficiency is based on data from Table 1 of 40 CFR 61, Appendix D, which indicates 90 percent efficiency for iodine gas.

[c] This scrubber is rated 98 percent efficient for removal of particulates 1 micrometer (Φm) or greater in diameter.

[d] Efficiency is based upon measured efficiency tests.

[e] Sulfur-impregnated charcoal adsorber system that consists of a set of eight cylindrical adsorber beds manifolded together in a parallel flow arrangement. Charcoal filters are located in series with HEPA filters in the primary confinement exhaust system. The overall efficiency for the system is 99.9 percent for particulate matter and 99 percent for activated mercury emissions.

[f] Isotek, LLC.

[g] Emission points where the source term is estimated entirely by calculations without any monitoring or sampling data (e.g., Appendix D of 40 CFR 61).

[h] The laboratory hoods may go through HEPA filters or roughing filters, or vent directly to the atmosphere depending on the specific hood. These hoods are modeled as six separate sources, depending on geographical grouping.

[i] The number in parentheses represents the building area numbers.

[j] Zero dose estimated.

SECTION II. SOURCE PARAMETER DATA FOR SOURCES – ETTP

Sources	Type of Control	Efficiency (%)	Stack Height, m	Stack Diameter, m	Exit Gas Velocity, m/s	Exit Gas Temperature, EC	Distance to Receptor (m)		
							Nearest Residence-R School-S Business-B	Source Maximally Exposed Individual	Nearest Farm Dairy - D Beef - B Vegetable - V
Major Point Sources									
K-1423 Solid Waste Repack[a] (Bechtel Jacobs)	HEPA Filter[b]	99	7.62	0.71	12.8	Ambient	200-B	200	3080-B
K-1435 TSCA Incinerator (Bechtel Jacobs)	Quench chamber, Venturi, Cross-flow packed bed, Ionizing wet scrubber	96 (total)	30.5	1.37	5.64	79.76	690-B	4170	3840-B
Minor Point Sources[c]									
K-25 Seg Shop 18A (Bechtel Jacobs)	HEPA Filter	99	18.3	1.37	2.56	Ambient	530-B	1040	2660-B
K-1407-U CNF Air Stripper (Bechtel Jacobs)	None	0	7.16	1.22	0.63	Ambient	360-B	360	3500-B
TSCAI WWTF (Bechtel Jacobs)	HEPA	99	4.3	0.34	4.06	Ambient	690-B	690	3870-B
Minor Grouped Sources[c]									
K-1435 Waste Feed Tanks (Bechtel Jacobs) (15 emission points)	None	0	18.29	0.2	0	Ambient	690-B	690	3870-B

[a] K-1423 Solid Waste Repack has been identified as a major onsite source but remains a minor offsite source.

[b] Abatement efficiencies from Table 1 of Appendix D of 40 CFR 61 conservatively used to calculate source terms. However, actual efficiencies are typically higher (i.e., HEPA filters are rated at 99.97 percent).

[c] Source term estimated entirely by calculations without monitoring or sampling data (e.g., Appendix D of 40 CFR 61).

ORR 2007 RADIONUCLIDE EMISSIONS[3] FROM POINT SOURCES

The following table shows total radionuclide emissions from point sources on the ORR. Also shown are the assumed lung clearance type and activity median aerodynamic diameters (AMADs). The designation of F, M, and S refers to the lung clearance type -- Fast (F), Moderate (M), and Slow (S) for the given radionuclide. The default AMAD of 1.0 μm was used for modeling. The chemical form used in most cases was unspecified, except when the chemical form was known and available in CAP88PC Version 3.

[3]Emissions are shown in curies (1 curie = 3.7E+10 becquerels).

ORR RADIONUCLIDE EMISSIONS – 2007

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	Solubility	AMAD	Chemical Form	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year
Ac-225	M	1	unspecified	1.20E-06			1.20E-06
Ac-228	M	1	unspecified	5.68E-08			5.68E-08
Ac-228	S	1	unspecified	7.49E-06			7.49E-06
Ag-110m	M	1	unspecified	1.61E-08			1.61E-08
Ag-110m	S	1	unspecified	2.06E-06			2.06E-06
Am-241	M	1	unspecified	1.58E-06	3.50E-09	8.57E-11	1.58E-06
Am-241	S	1	unspecified	8.01E-10		3.41E-07	3.42E-07
Am-243	M	1	unspecified	2.54E-11	3.50E-09		3.53E-09
Ar-41	G	0	unspecified	3.58E+03			3.58E+03
Ba-133	M	1	unspecified	7.36E-09			7.36E-09
Ba-137m	M	1	unspecified	1.54E-07			1.54E-07
Ba-139	M	1	unspecified	2.05E-01			2.05E-01
Ba-140	M	1	unspecified	1.28E-04			1.28E-04
Ba-140	S	1	unspecified	3.71E-05			3.71E-05
Be-7	M	1	unspecified	2.59E-05			2.59E-05
Bi-212	M	1	unspecified	7.77E-08			7.77E-08
Bi-213	M	1	unspecified	1.12E-05			1.12E-05
Bi-214	M	1	unspecified	2.64E-06			2.64E-06
C-11	G	0	dioxide	1.78E+01			1.78E+01
C-11	M	1	particulate	1.52E-01			1.52E-01
C-14	M	1	particulate	2.60E-10		1.29E-05	1.29E-05
Ce-139	M	1	unspecified	2.08E-09			2.08E-09
Ce-141	M	1	unspecified	3.45E-08			3.45E-08
Ce-144	M	1	unspecified	1.51E-10			1.51E-10
Cf-249	M	1	unspecified	7.95E-14			7.95E-14
Cf-250	M	1	unspecified	3.37E-12			3.37E-12
Cf-251	M	1	unspecified	1.47E-14			1.47E-14
Cf-252[1]	M	1	unspecified	1.05E-07			1.05E-07
Cm-242	M	1	unspecified	5.65E-08			5.65E-08
Cm-243	M	1	unspecified	2.59E-11			2.59E-11
Cm-244	M	1	unspecified	7.29E-06			7.29E-06
Cm-245	M	1	unspecified	1.73E-09			1.73E-09
Cm-246	M	1	unspecified	1.79E-09			1.79E-09
Cm-248[2]	M	1	unspecified	1.66E-13			1.66E-13
Co-56	M	1	unspecified	9.93E-09			9.93E-09
Co-57	M	1	unspecified	2.09E-06	6.95E-10		2.09E-06
Co-58	S	1	unspecified	2.82E-06			2.82E-06
Co-58	M	1	unspecified	4.60E-06	6.20E-12		4.60E-06
Co-60	M	1	unspecified	2.95E-04	9.29E-07	2.65E-10	2.96E-04

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	Solubility	AMAD	Chemical Form	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year
Co-60	S	1	unspecified	2.61E-06			2.61E-06
Cr-51	M	1	unspecified	7.74E-05			7.74E-05
Cs-134	F	1	unspecified	1.67E-08	5.56E-08		7.23E-08
Cs-134	S	1	unspecified	2.17E-06			2.17E-06
Cs-135	F	1	unspecified	2.18E-13			2.18E-13
Cs-136	F	1	unspecified	3.60E-16			3.60E-16
Cs-136	S	1	unspecified	6.54E-06			6.54E-06
Cs-137	F	1	unspecified	1.48E-03	6.25E-06	7.90E-10	1.49E-03
Cs-137	S	1	unspecified	2.99E-06		5.52E-05	5.82E-05
Cs-138	F	1	unspecified	8.86E+02			8.86E+02
Eu-152	M	1	unspecified	3.19E-07	2.63E-08		3.45E-07
Eu-154	M	1	unspecified	2.07E-07	3.33E-08		2.40E-07
Eu-155	M	1	unspecified	2.66E-10	9.52E-07		9.52E-07
Fe-55	M	1	unspecified	7.22E-05			7.22E-05
Fe-59	M	1	unspecified	1.32E-06			1.32E-06
Fe-59	S	1	unspecified	7.31E-06			7.31E-06
Ga-67	M	1	unspecified	1.82E-15			1.82E-15
Gd-153	M	1	unspecified	3.00E-09			3.00E-09
Ge-68	M	1	unspecified	3.75E-15			3.75E-15
H-3	M	1	particulate			1.60E-06	1.60E-06
H-3	V	0	vapor	5.41E+01	5.79E+00	6.00E+02	6.60E+02
Hf-172	M	1	unspecified	6.85E-14			6.85E-14
Hf-175	M	1	unspecified	8.09E-13			8.09E-13
Hf-178m	M	1	unspecified	5.14E-15			5.14E-15
Hf-181	M	1	unspecified	3.51E-15			3.51E-15
Hg-203	M	1	inorganic	9.28E-07			9.28E-07
I-124	F	1	particulate	6.92E-08			6.92E-08
I-125	F	1	particulate	5.42E-06			5.42E-06
I-126	F	1	particulate	4.92E-06			4.92E-06
I-129	F	1	particulate	1.21E-03			1.21E-03
I-130	F	1	particulate	1.96E-30			1.96E-30
I-131	F	1	particulate	6.20E-02		4.62E-10	6.20E-02
I-131	S	1	particulate	3.86E-05			3.86E-05
I-131	V	0	vapor	3.16E-02		4.62E-08	3.16E-02
I-132	V	0	vapor	2.88E-01			2.88E-01
I-133	V	0	vapor	1.63E-01			1.63E-01
I-133	F	1	particulate	7.16E-05			7.16E-05
I-134	V	0	vapor	4.56E-01			4.56E-01
I-135	V	0	vapor	5.04E-01			5.04E-01
Ir-192	M	1	unspecified	1.02E-06			1.02E-06
K-40	M	1	unspecified	3.60E-05			3.60E-05

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	Solubility	AMAD	Chemical Form	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year
K-40	S	1	unspecified	4.11E-05			4.11E-05
Kr-79	G	0	unspecified	1.50E-30			1.50E-30
Kr-81	G	0	unspecified	5.88E-12			5.88E-12
Kr-85	G	0	unspecified	1.61E+03		1.53E-02	1.61E+03
Kr-85m	G	0	unspecified	5.70E+00			5.70E+00
Kr-87	G	0	unspecified	8.23E+01			8.23E+01
Kr-88	G	0	unspecified	1.01E+02			1.01E+02
Kr-89[3]	G	0	unspecified	7.06E+01			7.06E+01
La-140	S	1	unspecified	1.57E-05			1.57E-05
La-140	M	1	unspecified	1.33E-05			1.33E-05
Lu-173	M	1	unspecified	7.57E-13			7.57E-13
Lu-174	M	1	unspecified	1.60E-13			1.60E-13
Lu-177m	M	1	unspecified	1.34E-14			1.34E-14
Mn-54	M	1	unspecified	1.99E-07			1.99E-07
Mn-54	S	1	unspecified	2.48E-06			2.48E-06
Mo-93	M	1	unspecified	1.36E-07			1.36E-07
Mo-99	M	1	unspecified	1.03E-10			1.03E-10
Mo-99	S	1	unspecified	7.74E-03			7.74E-03
N-13	G	0	unspecified	9.63E-01			9.63E-01
Na-22	M	1	unspecified	4.53E-09			4.53E-09
Nb-92[4]	M	1	unspecified	6.24E-09			6.24E-09
Nb-93m	M	1	unspecified	1.43E-07			1.43E-07
Nb-94	S	1	unspecified	2.14E-06			2.14E-06
Nb-94	M	1	unspecified	2.29E-09			2.29E-09
Nb-95	M	1	unspecified	1.07E-07			1.07E-07
Ni-59	M	1	particulate	4.44E-07			4.44E-07
Ni-63	M	1	particulate	4.35E-05			4.35E-05
Np-237	M	1	unspecified	4.80E-11	1.61E-08	9.37E-11	1.62E-08
Np-237	S	1	unspecified			5.08E-07	5.08E-07
Np-239	M	1	unspecified	1.05E-11			1.05E-11
O-15	G	0	unspecified	1.46E+00			1.46E+00
Os-185	M	1	unspecified	1.43E-16			1.43E-16
Os-191	M	1	unspecified	6.69E-04			6.69E-04
P-33	M	1	unspecified	1.37E-07			1.37E-07
Pa-234m	M	1	unspecified			1.72E-02	1.72E-02
Pb-210	M	1	unspecified	1.11E-06			1.11E-06
Pb-212	F	1	unspecified	4.74E-03			4.74E-03
Pb-212	M	1	unspecified	1.61E+00	5.41E-07		1.61E+00
Pb-214	M	1	unspecified	9.27E-09			9.27E-09
Pm-147	M	1	unspecified	9.35E-09			9.35E-09
Po-209[5]	M	1	unspecified	4.00E-06			4.00E-06

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	Solubility	AMAD	Chemical Form	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year
Pr-144	M	1	unspecified	7.58E-09			7.58E-09
Pu-236	M	1	unspecified		5.33E-09		5.33E-09
Pu-238	M	1	unspecified	7.05E-07	1.31E-08	2.01E-11	7.18E-07
Pu-238	S	1	unspecified			3.79E-07	3.79E-07
Pu-239	M	1	unspecified	2.32E-05	4.95E-08	6.95E-11	2.32E-05
Pu-239	S	1	unspecified			2.08E-06	2.08E-06
Pu-240	S	1	unspecified			7.05E-09	7.05E-09
Pu-240	M	1	unspecified	1.84E-09		6.95E-11	1.91E-09
Pu-241	M	1	unspecified	1.80E-07			1.80E-07
Pu-242	M	1	unspecified	7.12E-13	1.56E-08		1.56E-08
Pu-244[6]	S	1	unspecified	1.85E-9			1.85E-9
Ra-225	M	1	unspecified	1.00E-06			1.00E-06
Ra-226	S	1	unspecified	3.94E-05			3.94E-05
Ra-228	M	1	unspecified	7.53E-06			7.53E-06
Ra-228	S	1	unspecified	1.43E-08			1.43E-08
Re-188	M	1	unspecified	1.51E-05			1.51E-05
Ru-103	M	1	particulate	1.06E-09			1.06E-09
Ru-106	M	1	particulate	1.00E-05			1.00E-05
S-35	M	1	inorganic	5.00E-06			5.00E-06
Sb-124	M	1	unspecified	6.80E-07			6.80E-07
Sb-125	S	1	unspecified	5.40E-06			5.40E-06
Sb-125	M	1	unspecified	2.69E-07			2.69E-07
Sb-126	M	1	unspecified	1.90E-16			1.90E-16
Sc-46	M	1	unspecified	7.37E-11			7.37E-11
Se-75	F	1	unspecified	1.05E-04			1.05E-04
Sn-113	M	1	unspecified	1.70E-11			1.70E-11
Sn-119m	M	1	unspecified	1.25E-09			1.25E-09
Sr-85	M	1	unspecified	2.00E-09			2.00E-09
Sr-89	M	1	unspecified	2.78E-05			2.78E-05
Sr-89	S	1	unspecified			1.22E-06	1.22E-06
Sr-90	F	1	unspecified	9.68E-04			9.68E-04
Sr-90	M	1	unspecified	1.18E-04	2.14E-06		1.20E-04
Sr-90	S	1	unspecified	8.31E-06		1.22E-06	9.53E-06
Ta-179	M	1	unspecified	9.49E-14			9.49E-14
Ta-182	M	1	unspecified	7.14E-05			7.14E-05
Tc-95m	M	1	unspecified	2.30E-14			2.30E-14
Tc-96	M	1	unspecified	1.97E-14			1.97E-14
Tc-99	M	1	unspecified	1.29E-10	1.00E-03	6.32E-07	1.00E-03
Tc-99	S	1	unspecified	2.78E-05		3.58E-03	3.60E-03
Tc-99m	M	1	unspecified	1.20E-16			1.20E-16
Te-125m	M	1	particulate	1.20E-06			1.20E-06

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	Solubility	AMAD	Chemical Form	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year	Activity Ci/Year
Te-129	M	1	particulate	9.92E-12			9.92E-12
Te-129m	M	1	particulate	3.76E-07			3.76E-07
Th-228	S	1	unspecified	1.80E-06	8.23E-12	8.85E-06	1.07E-05
Th-229	S	1	unspecified	1.02E-08	3.50E-09		1.37E-08
Th-230	S	1	unspecified	2.53E-08	2.35E-08	5.50E-05	5.51E-05
Th-232	S	1	unspecified	9.15E-06	8.77E-09	1.05E-05	1.97E-05
Th-234	S	1	unspecified	3.52E-05		1.56E-03	1.60E-03
Tm-170	M	1	unspecified	1.00E-09			1.00E-09
U-232	S	1	unspecified	8.07E-16			8.07E-16
U-233	M	1	unspecified	5.50E-10			5.50E-10
U-233	S	1	unspecified	6.51E-06	8.51E-06	1.14E-07	1.51E-05
U-234	F	1	unspecified		6.68E-04		6.68E-04
U-234	M	1	unspecified	5.55E-10	2.22E-04		2.22E-04
U-234	S	1	unspecified	7.59E-06	7.40E-03	6.69E-04	8.07E-03
U-235	F	1	unspecified		2.07E-05		2.07E-05
U-235	M	1	unspecified	3.07E-10	6.89E-06		6.89E-06
U-235	S	1	unspecified	1.19E-06	2.35E-04	9.44E-04	1.18E-03
U-236	M	1	unspecified		9.24E-07		9.24E-07
U-236	S	1	unspecified	9.27E-07	3.19E-05	1.14E-06	3.39E-05
U-236	F	1	Unspecified		2.77E-06		2.77E-06
U-238	F	1	unspecified		1.88E-07		1.88E-07
U-238	M	1	unspecified	7.06E-10	6.22E-08		6.29E-08
U-238	S	1	unspecified	5.59E-05	3.28E-04	9.49E-04	1.33E-03
V-49	M	1	unspecified	8.74E-10			8.74E-10
W-181	M	1	unspecified	7.83E-10			7.83E-10
W-185	M	1	unspecified	2.09E-07			2.09E-07
W-188	M	1	unspecified	1.01E-05			1.01E-05
Xe-127	G	0	unspecified	2.97E-07			2.97E-07
Xe-129m	G	0	unspecified	8.70E-05			8.70E-05
Xe-131m	G	0	unspecified	9.80E+01			9.80E+01
Xe-133	G	0	unspecified	3.06E+00			3.06E+00
Xe-133m	G	0	unspecified	1.82E+01			1.82E+01
Xe-135	G	0	unspecified	3.85E+01			3.85E+01
Xe-135m	G	0	unspecified	1.74E+01			1.74E+01
Xe-137[7]	G	0	unspecified	7.61E+01			7.61E+01
Xe-138	G	0	unspecified	9.64E+01			9.64E+01
Y-87	M	1	unspecified	1.90E-16			1.90E-16
Y-88	M	1	unspecified	8.34E-09			8.34E-09
Y-88	S	1	unspecified	1.61E-06			1.61E-06
Y-90	M	1	unspecified	2.99E-11			2.99E-11
Y-91	M	1	unspecified	1.60E-08			1.60E-08

				Facility			
				ORNL	Y-12 Complex	ETTP	ORR
Nuclide	**Solubility**	**AMAD**	**Chemical Form**	**Activity Ci/Year**	**Activity Ci/Year**	**Activity Ci/Year**	**Activity Ci/Year**
Zn-65	M	1	unspecified	7.08E-09			7.08E-09
Zn-65	S	1	unspecified	5.56E-06			5.56E-06
Zr-88	M	1	unspecified	8.15E-08			8.15E-08
Zr-95	S	1	unspecified	4.88E-06			4.88E-06
Zr-95	M	1	unspecified	1.06E-07			1.06E-07
Totals				6.76E+03	5.80E+00	6.00E+02	7.37E+03

[1] Cf-248 was used as a surrogate for Cf-252.
[2] Cm-245 was used as a surrogate for Cm-248.
[3] Kr-88 was used as a surrogate for Kr-89.
[4] Nb-94 was used as a surrogate for Nb-92.
[5] Po-210 was used as a surrogate for Po-209.
[6] Pu-239 was used as a surrogate for Pu-244.
[7] Xe-135 was used as a surrogate for Xe-137.

POTENTIAL FUGITIVE AND DIFFUSE SOURCES ON THE ORR[a]

Y-12 Complex:

- Vehicle storage area north of Building 9219
- Vehicle storage area south of Building 9720-13
- Contaminated Metal Salvage Yard south of Building 9114
- Equipment/tooling lay-down area west of Building 9204-4
- Disposal Area Remedial Action Solid Storage Facilities (Building 9720-60)
- Environmental Management Waste Management Facility Land Fill
- Low-level liquid tanks and associated valves and piping, outside storage, waste storage, inactive buildings and demolition of inactive buildings (infrastructure reduction)

ETTP:

- K-710-D Sludge Settling Basis remediation
- K-770 Contaminated Scrap Metal Yard remediation
- K-901-A Disposal Area
- K-1064 Contaminated Scrap Metal Yard
- K-1070-B Burial Ground
- K-1070-C/D Burial Ground
- K-1203 Sewage Sludge Drying Beds
- Low-level liquid tanks and associated valves and piping, inactive buildings, outside storage, waste storage, UF_6 Cylinder Yards, decontamination activities of active and inactive buildings, and demolition of inactive buildings
- Specific examples of building demolition/decontamination locations are: K-25, K-27, K-29, K-1004-L, K-1008-A/B/C/D, K-1015, K-1020, K-1021, K-1401, and K-1420

ORNL:

- Bethel Valley and Melton Valley restoration projects
- Solid Waste Storage Areas 3, 4, 5, and 6
- Surface impoundments/retention basins [2544 (Sewage Holding Pond), 3513, 7905, 7906, 7907, 7908, and White Oak Lake]
- 7822B (Fissile Disposal Wells); 7822C (Low Range Silos); 7822D (High Range Silos); 7822H (Asbestos Silos)
- 7841 (Contaminated Equipment Storage Yard)
- 7853 (Liquid and Gaseous Waste Operations Storage Building)
- Low-level liquid waste tanks and associated valve pits and piping
- Decontamination and maintenance activities

[a] This list identifies the largest areas on the ORR with the most significant potential for fugitive and diffuse emissions. Environmental measurements are used to demonstrate that total emissions (point, diffuse, and fugitive) from the ORR result in a dose less than 10 mrem/year (0.1 mSv/year). See Section III, Dose Assessments.

SECTION III. DOSE ASSESSMENTS

DESCRIPTION OF DOSE MODEL

The radiation dose calculations were performed using the CAP-88PC Version 3. The CAP88 Model is a set of computer programs, databases and associated utility programs for estimation of dose and risk from radionuclide emissions to air. CAP88 is composed of modified versions of AIRDOS-EPA and DARTAB. CAP88PC contains EPA's version of the AIRDOS-EPA computer code, which implements a steady-state, Gaussian plume, atmospheric dispersion model to calculate environmental concentrations of released radionuclides and then food chain models are used to calculate human exposures, both internal and external, to the environmental concentrations.

This is the first year CAP88PC Version 3 has been used. A major difference between the earlier CAP88 and the CAP88 PC Version 3 is the use of dose factors from Federal Guidance Report (FGR) Number 13 (EPA, 1999). The FGR 13 dose factors are based on the methods in Publication 72 of the International Commission on Radiological Protection (ICRP 1996). The dose factors are used to calculate effective doses, instead of effective dose equivalents (EDEs), which were calculated in earlier CAP88 versions. The ED, as was the EDE, is the weighted sum of equivalent dose over specified tissues or organs. For the ED, there are tissue weighting factors for twelve tissues or organs (as well as one for remainder organs and tissues), as compared to the EDE, there were six tissue weighting factors (and one for remainder organs and tissues). In addition to tissue weighting factor modifications, there have been updates to the lung model, gastrointestinal absorption fractions, and biokinetic models used for selected elements.

SUMMARY OF INPUT PARAMETERS

Except for those given below, all important input parameter values used are the default values provided with the CAP-88 computer codes and databases.

Food consumption data:

The sources of foodstuffs consumed by exposed persons are the CAP-88 rural area default values:

Foodstuff	Fraction grown		
	In local area	Within 50-mile radius	Beyond 50-miles radius
Vegetables and produce	0.70	0.30	0.00
Meat	0.44	0.56	0.00
Milk	0.40	0.60	0.00

Dose evaluated at business locations:

DOE estimates doses to individuals located at businesses in the vicinity of the ORR using the same methodology as for the residential exposure scenario [i.e., assuming full occupancy (8,760 hours/year) and the rural food source scenario in CAP-88], but divides the resulting dose in half. The resulting estimated business dose more accurately represents the time of exposure a single person would be exposed to airborne radionuclide emissions (4,380 hours/year), which is more than double the normal work year of 2,080 hours.

Meteorological data:

Figure 3 shows the locations of meteorological towers on the ORR. The meteorological data listed below were deemed acceptable for use in assessing radiation doses from the indicated sources. All meteorological data were reviewed by an onsite air quality meteorologist and, based on the judgment of the meteorologist, data acquired from stations with low recovery rates were corrected with other onsite meteorological data as necessary.

Tower:	MT1 (K1208)		MT2 (Tow C)			MT3 (Tow B)		MT4 (Tow A)		MT6 (West Y12)	MT7 (K1209)	
Station:	10-m	60-m	10-m	30-m	100-m	10-m	30-m	10-m	30-m	60-m*	10-m	30-m
Percent Minimum quarterly data recovery corrected/ (uncorrected):	98.6 (100.0)	98.6 (100.0)	100.0 (91.4)**	100.0 (96.1)	100.0 (96.8)	100.0 (99.2)	100.0 (99.2)	100.0 (96.5)	100.0 (96.5)	100.0 (96.3)	100.0 (98.6)	100.0 (98.6)
Percent Annual data recovery corrected/(uncorrected):	99.5 (100.0)	99.5 (100.0)	100.0 (98.3)	100.0 (97.5)	100.0 (97.9)	100.0 (99.7)	100.0 (99.7)	100.0 (99.3)	100.0 (99.3)	100.0 (99.1)	100.0 (99.5)	100.0 (99.5)
Rainfall rate (cm/year):	93.6	93.6	96.3	96.3	96.3	96.3	96.3	96.3	96.3	97.0	89.7	89.7
Average air temperature (EC):	15.7	15.8	15.2	15.7	16.0	15.6	15.1	15.3	15.4	15.8	15.2	15.5
Emission sources:	1435C – WFT WWTF	K-1435 TSCAI	X-2099 X-2523 X-3074 X3544 X-3608FP X-STP X-3597	X-2026 X-3608AS X-5505 X-Decon Hoods X-Hoods (1000, 3000,4000 Areas)	X-3018 X-3020 X-3039		X-Hoods (6000 Area)	X-7830 Grp X7966	X-7503 X-7856-CIP X-7877 X-7880 X-7911 X-Hood (7000 Area)	All Y-12 Complex sources, labeled as Y-.... X8915 SNS	K-1407-U CNF, K-1423 SWT	K-25 Seg Shop

*The 60-m data and, after 09/01/05, 30-m winds were scaled to reflect 20-m wind speeds.

**Lower than average recovery for Tower C during Quarter 3 of 2007 was the result of a major data logger and data collection system upgrade.

Average mixing layer height: 590.1 m.

ORR COMPLIANCE ASSESSMENT

Oak Ridge Reservation ED: 0.3 mrem/year (0.003 mSv/year)

Location of maximally exposed individual (MEI):
10960 m E of the TSCA Incinerator at ETTP;
4260 m ENE of the 7911 Stack at ORNL; and
5800 m S of the composite release point at the Y-12 Complex

Of these emissions, there were seven radionuclides which did not have dose conversion factors in the CAP88PC Version 3 dose coefficient database. We have obtained approval from the EPA to use radionuclide surrogates to estimate doses for these seven radionuclides.

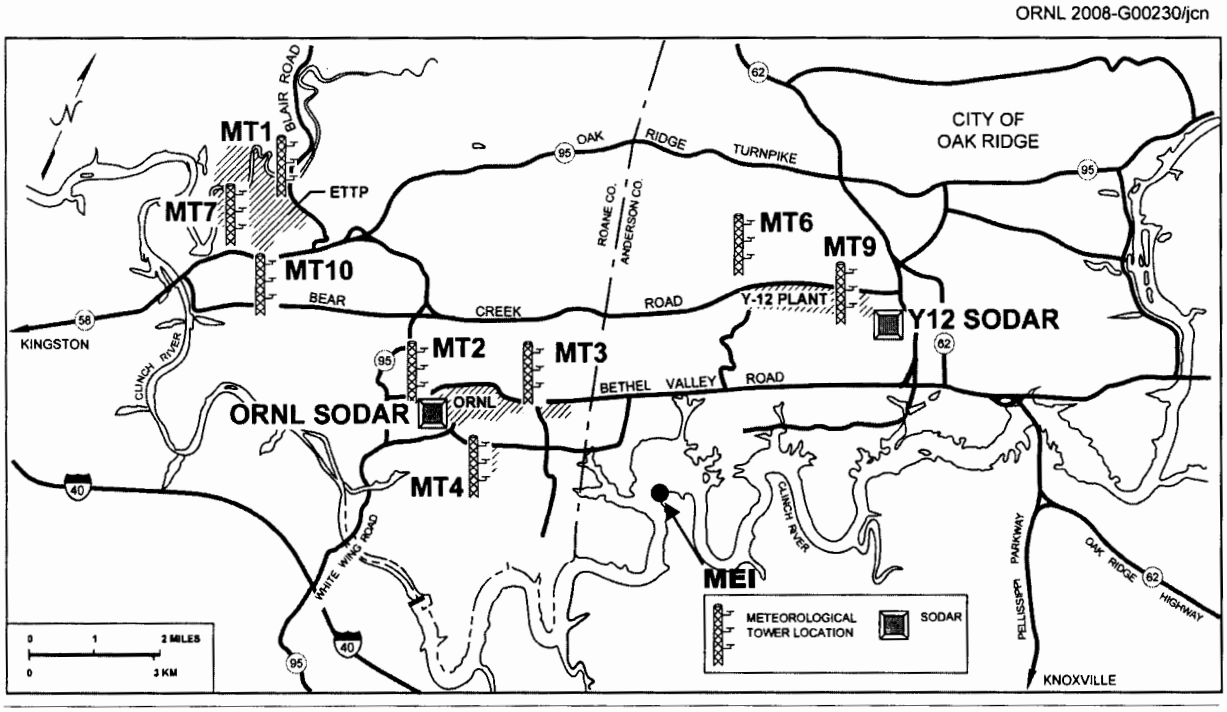

Fig. 3: Locations of meteorological towers on the ORR and the CY 2007 MEI.

DIFFUSE/FUGITIVE EMISSIONS

Diffuse/fugitive sources include any source that is spatially distributed, diffuse in nature, or not emitted with forced air from a stack, vent, or other confined conduit. Diffuse/fugitive sources also include emissions from sources where forced air is not used to transport the radionuclides to the atmosphere. In this case, radionuclides are transported entirely by diffusion and/or thermally driven air currents. Typical examples of diffuse/fugitive sources include emissions from building breathing; resuspension of contaminated soils, debris, or other materials; unventilated tanks; ponds, lakes, and streams; wastewater treatment systems; outdoor storage and processing areas; and leaks in piping, valves, or other process equipment. Section II provides a list of potential fugitive/diffuse sources on the ORR. However, this list is not intended to include all areas with potential emissions because most of the manufacturing and research areas on the ORR have handled radioactive materials in the past.

EPA has not defined requirements for reporting and estimating emissions for fugitive and diffuse sources in 40 CFR 61, Subpart H. However, a guidance letter from Winston A. Smith, EPA Region 4, to R. R. Nelson, DOE-ORO, on March 24, 1992,[4] allowed the use of environmental measurements such as ambient air monitoring to confirm compliance for fugitive and diffuse sources as long as this methodology was "coordinated between DOE and EPA." In response to the March 24, 1992, letter and an EPA visit to the ORR in April 1992, a plan was developed by DOE-ORO to confirm compliance for fugitive and diffuse sources by measuring atmospheric concentrations of radionuclides at critical receptor locations using a network of ambient air monitors around the ORR. This plan was submitted to EPA headquarters October 28, 1992,[5] and was implemented January 1993. Doses calculated from the ambient air monitoring results have been provided to EPA as supplementary information in the ORR Annual Radionuclide Air Emissions Report since 1992 consistent with the Memorandum of Understanding between DOE and EPA Headquarters.[6, 7] In October 2001, EPA Region 4 approved Addendum C.1,

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[4]Letter, Winston A. Smith, Director, Air, Pesticides and Toxics Management Division, EPA Region 4, to R. R. Nelson, DOE-ORO, "Fugitive Radionuclides Air Emissions From DOE Facilities," March 24, 1992.

[5]Letter, R. R. Nelson of DOE to Winston A Smith of EPA, "Fugitive Radioactive Air Emissions from DOE Facilities," with Attachment, "Environmental Monitoring Plan For Airborne Radioactivity from Fugitive and Diffuse Sources, Oak Ridge, Tennessee," October 28, 1992.

[6]Memorandum with Attachment, Peter J. Gross to DOE site Managers and Directors, June 20, 1995, Attachment, "MOU Between the U.S. Environmental Protection Agency and the U.S. Department of Energy Concerning the Clean Air Act Emission Standards for Radionuclides 40 CFR 61 Including Subparts H, I, Q & T," April 5, 1995.

[7]The April 5, 1995, MOU between EPA and DOE was in draft form in 1992, which included an agreement to include data on fugitive and diffuse emissions as supplementary information in the annual air emissions report.

Monitoring for Fugitive and Diffuse Sources, to the *Compliance Plan*, which formalized the use of environmental measurements from ambient air monitoring to confirm compliance for fugitive and diffuse sources for the ORR.

The table on the following page contains the estimated doses at each ambient air monitoring station calculated using measured ambient air concentrations of radionuclides. Figure 4 provides the location of each perimeter air monitoring station. Doses calculated at the stations ranged between 0.005 and 0.1 mrem/year (0.00005 and 0.001 mSv/year). These doses do not include contributions of naturally occurring ^{40}K and ^{7}Be. The highest potential dose, 0.1 mrem/year (0.001 mSv/year) was recorded at Station 38, which is located northeast of ETTP. The dose calculated at the background station was about 0.003 mrem/year (0.00003 Sv/year). All calculated doses were below the 0.3 mrem/year (0.003 mSv/year) maximum that was modeled for only point source emissions and data show that all measurements are well below the 10 mrem annual dose limit.

ESTIMATED DOSES AT THE ORR PERIMETER AIR MONITORING STATIONS – 2007

Ambient air station number	Effective Dose (mrem/year)[a, b]
35	0.08
37	0.05
38	0.1
39	0.005
40	0.04
42	0.03
46	0.01
48	0.005
Fort Loudon Dam (Background)	0.003

[a] 100 mrem = 1 mSv.

[b] Doses exclude contributions from Be-7 and K-40 radionuclides but do not exclude the contributions from other background (naturally occurring) radionuclides.

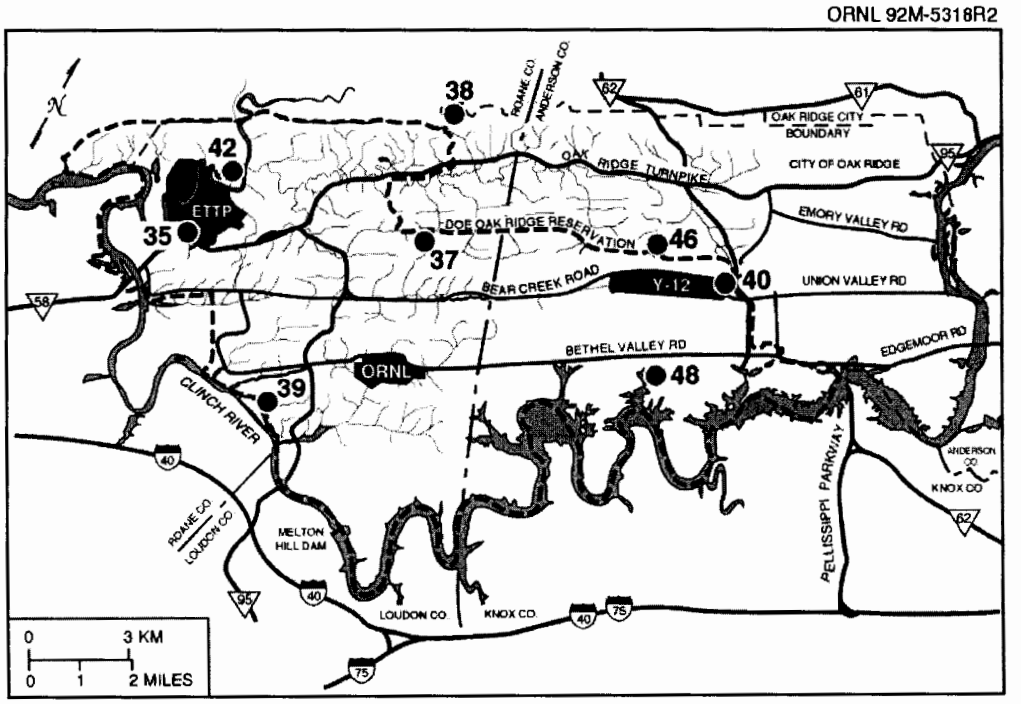

Fig. 4: Approximate locations of ORR perimeter air monitors.

FACILITIES REVITALIZATION CONSTRUCTION PROJECT AMBIENT AIR RESULTS

In 2007, an ambient air monitoring station was located at the 4000 substation (located next to the Multiprogram Research Facility construction site) as an alternative method to demonstrate compliance with 40 CFR 61, Subpart H. Details of EPA guidance and approval for use of the ambient air monitoring station to demonstrate compliance are given in Section I, "Source Description: Oak Ridge National Laboratory." This ambient air monitor operated only 41 days in 2007, due to completion of construction of the Multiprogram Research Facility. Based on quarterly and annual averaged air concentrations of radionuclides that could have come from ORNL, a construction worker at the ambient air monitor could have received an ED of about 0.04 mrem over the year. This dose does not include the contributions of naturally occurring ^{40}K and ^{7}Be; however, it does include contributions from other potentially naturally occurring radionuclides, e.g., ^{232}Th, ^{238}U, since these radionuclides are also emitted from the facility. The primary contributor to the dose was ^{3}H which contributed about 51 percent of the dose. This dose is less than the estimated dose of 0.2 mrem/year calculated for the construction area using CAP-88 and all emissions from the ORR.

A second ambient air monitor, located in the 1000 area next to the Joint Institute for Biological Sciences construction site, operated the full year. Based on annual averaged air concentrations of radionuclides that could have come from ORNL, a construction worker at this ambient air monitor could have received an ED of about 0.04 mrem over the year. This dose does not include the contributions of naturally occurring ^{40}K and ^{7}Be; however, it does include contributions from other potentially naturally occurring radionuclides, e.g., ^{232}Th, ^{238}U, since these radionuclides are also emitted from the facility. Again, the primary contributor to the dose was ^{3}H which contributed about 63 percent of the dose. This dose is less than the estimated dose of 0.1 mrem/year calculated for the construction area using CAP-88 and all emissions from the ORR.

A third ambient air monitor, located in the 2000 area next to the proposed Science and Technology Park construction site, operated the full year. Based on annual averaged air concentrations of radionuclides that could have come from ORNL, a construction worker at this ambient air monitor could have received an ED of about 0.04 mrem over the year. This dose does not include the contributions of naturally occurring ^{40}K and ^{7}Be; however, it does include contributions from other potentially naturally occurring radionuclides, e.g., ^{232}Th, ^{238}U, since these radionuclides are also emitted from the facility. Again, the primary contributor to the dose was ^{3}H, which contributed about 63 percent of the dose. This dose is less than the estimated dose of 0.2 mrem/year calculated for the construction area using CAP-88 and all emissions from the ORR.

Data show that measurements are below the 10 mrem annual dose limit.

ETTP AMBIENT AIR NETWORK

The ETTP operates a separate ambient air network with stations located specifically to measure for air contaminants emanating from this site. Figure 5 provides the location of each ETTP station. Two of the ETTP stations (K2 and K6) are located in the prevailing upwind and downwind sectors with respect to the plant, but within the ORR boundary. Additionally, the downwind location is in the region of the modeled annual maximum impact location with respect to all ETTP sources, including the TSCA Incinerator. Two supplemental stations operated during this reporting period. One temporary station was located to the southwest of the ETTP station K9 between a rad-contaminated scrap metal yard and an offsite residential receptor. This station was used to assess the dose from DOE radiological emissions that included the K-770 scrap metal yard remediation activity. This station was discontinued in April 2007 following the completion of the remediation and demolition work. The second station (K11) is located adjacent to Building K-1036 that is an onsite business receptor. This station was placed at this location due to the potential dose impact of the K-1423 Solid Waste Repack operation being in excess of 0.1 mrem/year. Isotopic analyses of quarterly composite samples collected by the ETTP ambient air monitoring network were performed to assess the presence of airborne transuranics and isotopes of uranium. The results of the ETTP network also support the conclusion that dose estimates by CAP-88 are conservative.

The ETTP ambient air radionuclide data presented in the concentration results table have been calculated to assure conservatism. Data was reviewed such that any analytical result reported as negative was assumed to be zero. The analytical results were not corrected for naturally occurring background levels, blank filter background levels, measurement uncertainties, or detection limits. It was assumed that a member of the public could be exposed to these radionuclide concentrations for the entire year although the sampler locations are considered business exposure locations.

The estimated doses table summarizes calculations from analyses for isotopes of uranium and radiochemical analyses for selected transuranics. Dose values were determined using the CAP-88 computer dose assessment code. Values were estimated, considering uptake routes to an exposed individual as accounted for by the CAP-88 code, assuming EPA's rural food source scenario. Dose calculations based on ETTP specific analyses support the conclusions of the ORR ambient air results. Data show that all measurements are well below the 10 mrem annual dose limit.

ETTP AMBIENT AIR ANNUAL CONCENTRATION RESULTS by ALPHA SPECTROSCOPY – 2007

	Concentration, (μCi/mL)[a]			
	K2	K6	K9	K11
Np-237	8.86E-19	ND[b]	ND	ND
Pu-238	ND	ND	ND	ND
Pu-239	1.04E-18	9.22E-19	ND	4.37E-19
Tc-99	3.74E-16	1.57E-16	ND	9.92E-16
U-234	2.71E-17	6.30E-18	7.75E-18	2.18E-17
U-235	1.57E-18	ND	ND	7.14E-19
U-236	7.13E-19	ND	ND	ND
U-238	8.25E-17	8.50E-18	6.74E-18	2.11E-17
Total U	1.12E-16	1.48E-17	1.45E-17	4.37E-17

[a] All K2, K6, K9, and K11 results are the average of 4 quarterly analyses and assumed to represent an annual average value.
[b] ND = Not detectable from minimum analytical limits.

ESTIMATED DOSES AT THE ETTP AIR MONITORING STATIONS - 2007

Ambient air station number	Effective Dose (mrem/year)[a, b]
K2	0.04
K6	0.01
K9	0.004
K11	0.04

[a] 100 mrem = 1 mSv.
[b] ETTP doses are not corrected for background.

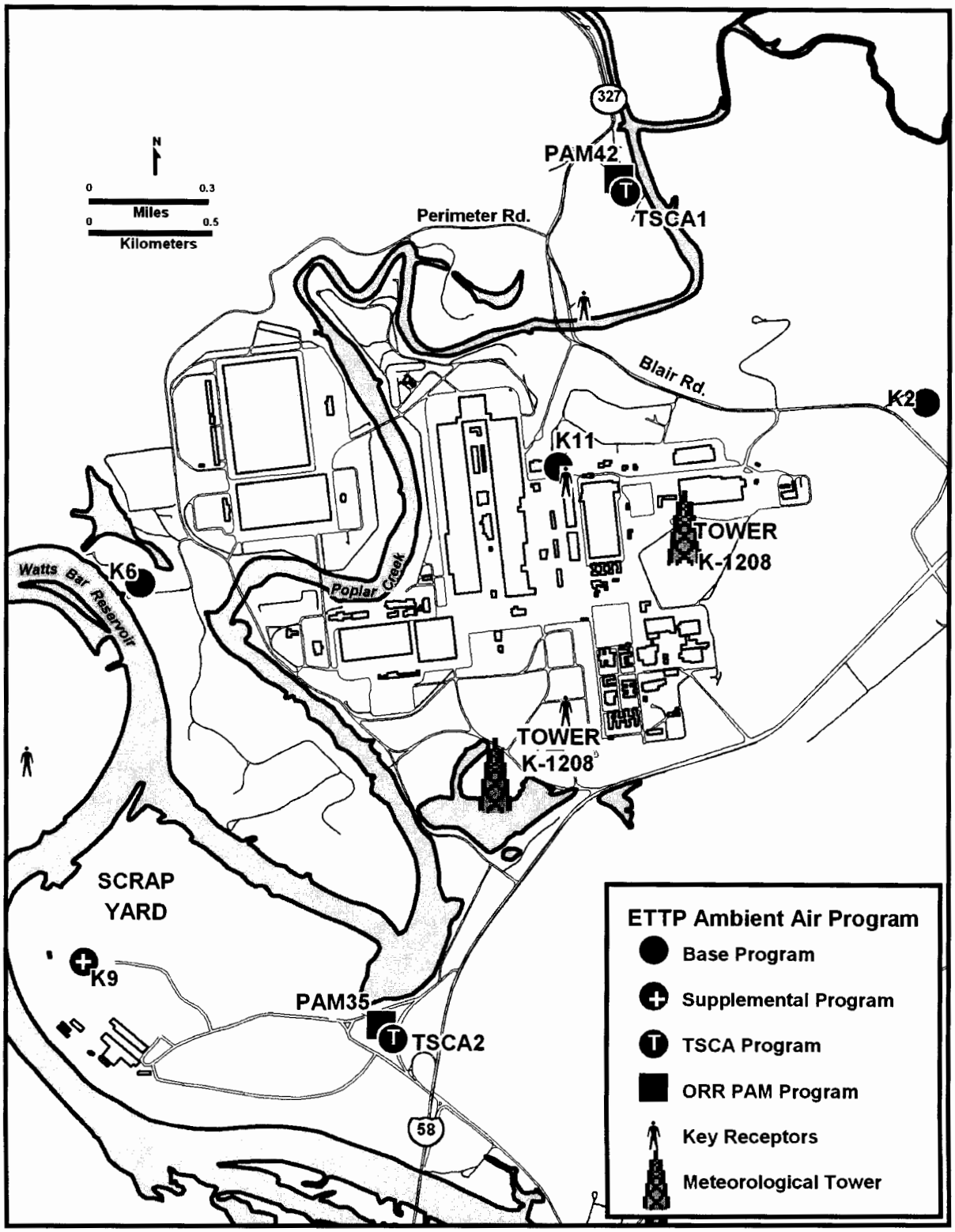

Fig. 5. Approximate locations of ETTP ambient air monitors during 2007.

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (See 18 U.S.C. 1001.)

Gerald G. Boyd, DOE-ORO — Date 6/23/08
Manager, Oak Ridge Operations Office

Theodore D. Sherry, DOE-NNSA — Date 6/19/08
Manager, Y-12 Site Office

SECTION IV. ADDITIONAL INFORMATION

NEW/MODIFIED SOURCES COMPLETED IN 2007

Y-12 Complex: No new sources were added or modified during this reporting period.

ORNL: No new sources were added or modified during this reporting period.

ETTP: An Appendix D calculation, incorporating engineering estimates and judgment as approved in the March 2005 *Compliance Plan*, was used to estimate potential and actual emissions for one new source at ETTP: TSCAI WWTF Sludge Press. This source was determined to be less than 0.1 mrem yr (0.001 mSv/yr) to any member of the public and reported in the minor source category.

UNPLANNED RELEASES

Y-12 Complex: There was one unplanned release that occurred in 2007. On March 15, 2007, a small metal fire in Building 9204-2E resulted in an operational emergency. The fire was extinguished and there were no injuries or contamination to workers and no building damage. The source term for this event is included in this report as a minor source.

ORNL: No unplanned releases in 2007.

ETTP: No unplanned releases in 2007.

SECTION V. SUPPLEMENTAL INFORMATION

COLLECTIVE ED (PERSON-REM/YEAR) – 50-MILE RADIUS

Installation	Total[a]
Y-12 Complex	1.5
ORNL	17.2
ETTP	0.8
ORR	19.5

[a] The summation of numbers may differ because of rounding and use of significant figures.

COMPLIANCE WITH SUBPARTS Q AND T OF 40 CFR 61

Not applicable.

^{220}Rn, ^{222}Rn EMISSIONS

ORNL: ^{220}Rn and ^{222}Rn were not emitted from effluent streams located in Bethel Valley. Lead-210, a daughter product of ^{222}Rn, was emitted from one facility in Melton Valley. Small amounts of ^{226}Ra, the progenitor of ^{222}Rn, were found in the effluent stream from one facility in Melton Valley.

Y-12 Complex: The radionuclide content of materials shipped to the Y-12 Complex for processing, as well as the material streams in process at any time, are measured and controlled by technical specification. Based on the radionuclide content of the material streams currently and historically processed at the Y-12 Complex, the emission of ^{220}Rn is reasoned to be insignificant. Radium-226, the progenitor of ^{222}Rn, is removed from natural uranium at the mills of origin. Therefore, ^{222}Rn generation from the uranium streams processed at the Y-12 Complex should be minimal.

ETTP: There are no known sources of ^{220}Rn or ^{222}Rn at the ETTP. Although trace quantities of ^{234}U are found at the ETTP, the long half-life and the small quantities present indicate that it is very unlikely that ^{222}Rn is present in significant amounts.

STATUS OF COMPLIANCE WITH NESHAPS MONITORING REQUIREMENTS OF SUBPART H

ORNL: Seven emission points were subject to the continuous emission monitoring requirements of 40 CFR 61.93(b). Each of these emission points complies with the regulatory requirements. In addition, there were two other sources that were continuously monitored to ensure compliance in the event of an increase in the potential dose.

Y-12 Complex: Thirty six permitted emission points were subject to and comply with the continuous emission monitoring requirements of 40 CFR 61.93 (b). In addition, there were seven other sources that were continuously monitored.

ETTP: Two emission points were subject to the continuous emission monitoring requirements of 40 CFR 61.93(b). These emission points comply with regulatory requirements.

MINOR SOURCES: The periodic confirmatory measurement plan for minor sources is outlined in detail in the *Compliance Plan* which was originally submitted to EPA on December 27, 1991, and was updated on May 26, 1994. In addition, the specific methods used for each minor and/or grouped source were provided to EPA Region 4 by June 15, 1992, for the Y-12 Complex and ORNL and by September 15, 1992, for the ETTP. Methods allowed for periodic confirmatory measurements include (1) radionuclide inventory (e.g., mass balance), (2) health physics data and building ventilation flow rates, (3) modified Method 5 sampling, and (4) various other engineering calculations.

STATUS OF QUALITY ASSURANCE PLANS

Each of the major ORR installations has prepared a Quality Assurance (QA) Plan in accordance with 40 CFR 61, Appendix B, Method 114. The final plans were submitted to EPA by June 15, 1992, in accordance with the ORR FFCA. ORISE has obtained a waiver from EPA for developing a QA plan because the quantities of radionuclides used are less than the quantities identified in 40 CFR 61, Appendix E. As a result of extensive organizational changes, ORNL's QA Plan was reissued during 1998. The ETTP NESHAP QA Plan was updated in 2007 to address site Reindustrialization and the roles and responsibilities of other prime contractors, subcontractors, and lessees subject to 40 CFR 61 as onsite members of the public and the monitoring requirements under ANSI-1999 for new and grandfathered sources. The Y-12 Complex's Environmental Compliance Department issued a document detailing the Quality Assurance activities for regulatory report preparation in January 2005. The NESHAPs QA Plan identified in the document was updated in July 2005 to reflect changes in organizational structures and procedural updates.

MPT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 30 2005

4APT-ATMB

Mr. David R. Allen
Director
Environmental and Quality Management Division
Department of Energy
Oak Ridge Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Allen:

We have reviewed your "Proposed Addendum for Insertion into the Oak Ridge Reservation (ORR) Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP) Compliance Plan under Appendix C (Future Agreements) and Proposed Revision to Section 2.1 of the Compliance Plan", dated February 11, 2005. The review we conducted was coordinated with the Tennessee Department of Environment & Conservation (TDEC).

Based on our review and the input received from TDEC, we acknowledge that addendum C.3 and the revision to Section 2.1 should be added to the ORR NESHAP Compliance Plan.

If you have any questions about the information provided in this letter, please contact Mr. Lloyd Generette of the EPA Region 4 staff at (404) 562-9138.

Sincerely,

Beverly Banister
Director
Air, Pesticides & Toxics
Management Division

cc: B. R. Stephens - TDEC
J. A. Owsley - TDEC
S. Szendy - TDEC

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
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OCT 19 2001

4APT-ATMB

Mr. David R. Allen, Lead
Environmental Protection Group
Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Allen:

We have reviewed your two proposed Addendums developed for insertion into the National Emission Standard for Hazardous Air Pollutants (NESHAP) Compliance Plan for Airborne Radionuclides on the Oak Ridge Reservation. Addendum C.1 titled Monitoring for Fugitive and Diffuse Sources addresses ambient air monitoring to confirm compliance for fugitive and diffuse sources. Addendum C.2 titled Monitoring Plan for On-Site Receptors addresses ambient air monitoring in lieu of stack monitoring for minor sources that become major as a result of the presence of on-site receptors.

The original submittal of the compliance plan was in 1991 and was written to fulfill requirements of the Federal Facilities Compliance Agreement (FFCA) between the Environmental Protection Agency (EPA) and the Department of Energy (DOE). According to section 61.92 of Subpart H of the Radionuclide NESHAP, emissions of radionuclides to the ambient air shall not exceed those amount that would cause any member of the public to receive in any year an effective dose equivalent of 10mrem/yr. Based on the telefaxed receipt of your revision to paragraph 2, page C-2-2 dated October16, which addresses a concern that we had with your original submittal transmitted in your September 25, 2001 letter, we approve the addition of Addendums C.1 and C.2 to the Compliance Plan.

If you have questions or need further information, please contact Mr. Lloyd Generette of the EPA Region 4 staff at 404-562-9138.

Sincerely,

Winston A. Smith
Director
Air, Pesticides and Toxics
Management Division

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March 15, 1994

COMPLIANCE PLAN
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AIRBORNE RADIONUCLIDES ON THE OAK RIDGE RESERVATION, OAK RIDGE, TENNESSEE

March 30, 2005

Prepared by
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For the U.S. Department of Energy under Contract No. DE-AC05-00OR22725
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Managed by BWXT Y-12, LLC
For the U. S. Department of Energy under Contract No. DE-AC05-00OR22800
And by
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Managed by Bechtel Jacobs Company LLC
For the U. S. Department of Energy under Contract No. DE-AC05-98OR22700

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(Approved: March 30, 2005)

ACRONYMS

ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
CFR	*Code of Federal Regulations*
DAC	derived air concentration
DOE	U.S. Department of Energy
EDE	effective dose equivalent
EPA	Environmental Protection Agency
FFCA	Federal Facilities Compliance Agreement
HEPA	high-efficiency particulate air
NESHAP	National Emission Standards for Hazardous Air Pollutants
NRC	Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
ORISE	Oak Ridge Institute of Science and Education
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
QA	Quality Assurance
TSCA	Toxic Substance Control Act

1. INTRODUCTION

The original submittal of the Oak Ridge Reservation (ORR) Compliance Plan in December 1991 was to fulfill a U.S. Department Of Energy (DOE) commitment to the Environmental Protection Agency (EPA), Region IV, as part of a Federal Facilities Compliance Agreement (FFCA). The FFCA was used to ensure compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radionuclides that are found in Chapter 40 of the *Code of Federal Regulations* (CFR), Part 61, Subpart H. DOE's FFCA commitments were completed in December 1992, but the Compliance Plan is still needed as an ongoing guidance document.

The updated Compliance Plan incorporates numerous agreements that were finalized after the original December 1991 submittal and also deletes references to scheduled updates that were completed as requirements of the FFCA. The majority of the actions have been merged into an applicable section. However, because of the importance of the Quality Assurance (QA) Plans for each facility, a brief QA section has been added. A section for future agreements between the ORR facilities and the EPA has also been included and reserved as Appendix C. Future agreements will be added to Appendix C of the Compliance Plan as an addendum.

The ORR consists of four separate installations: the Oak Ridge Y-12 Plant, the Oak Ridge National Laboratory (ORNL), the Oak Ridge K-25 Site, and the Oak Ridge Institute of Science and Education (ORISE). ORISE was identified in the original Compliance Plan as the Oak Ridge Associated Universities (ORAU). The ORR complies with the NESHAP regulation as a single facility as specified under "Discussion of Source Categories, VI.A.4.d, Definition of a Facility," in Volume 54, No. 240, p. 51665 of the *Federal Register*.

The general compliance approach is to continuously sample all point sources with the potential to emit radionuclides that could result in radiation doses equal to or greater than 0.1 millirem per year (mrem/year) effective dose equivalent (EDE) to the most affected off-site member of the public. All references to dose in this document are in terms of EDE to the most affected off-site member of the public. Emissions from release points with resulting potential doses less than 0.1 mrem/year are estimated using EPA-approved methods, as described in this plan or otherwise approved by EPA. Data from the stack sampling systems and estimates from low-emitting release points will be combined to calculate an airborne radionuclide source term for subsequent dispersion modeling and dose assessments. From these calculations, the estimated resulting dose to the most affected member of the public is compared to the dose standard of 10 mrem/year, as stated in 40 CFR 61.92.

2. SOURCE EVALUATION PLANS

To maintain compliance with the sampling and measurement provisions of 40 CFR Part 61.93, the location of potential sources must first be identified. Subsequently, an estimate of the actual and potential radionuclide emissions must be made. This section outlines the methods for identifying the potential sources, and later sections discuss the methods used to estimate actual and potential emissions.

2.1 MAJOR INSTALLATIONS

Significant efforts are undertaken at each installation to identify areas that may pose a potential radiological health hazard to employees. These efforts are needed to comply with worker protection requirements of federal and state safety and health laws and applicable DOE orders. Procedures are strictly enforced at each installation to properly identify and control such areas to assure that radiation exposure is kept below applicable standards and to minimize worker exposure to levels as low as reasonably achievable (ALARA).

Radiological Areas are established under specific criteria mandated by Chapter 10 CFR Part 835, *Occupational Radiation Protection*, and implemented by various worker protection procedures and standards enforced by each installation. A Radiological Area is any area where

- an individual can receive a deep dose equivalent greater than 5 mrem in 1 hour at 30 cm from a radiation source or from any surface through which the radiation penetrates, or
- the concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in appendix A or appendix C of 10 CFR 835; or an individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week, or
- removable surface contamination levels exceed or are likely to exceed the removable surface contamination values specified in appendix D of 10 CFR 835.

Although the limits for airborne radioactivity are for the workplace, they can be used for comparison purposes for public exposures. The DACs are defined to be the airborne concentration of radionuclides in the workplace which would cause a maximum total effective dose equivalent of 5,000 mrem to workers breathing the air or immersed in the air during one normal work year. All areas with potential airborne radioactivity exceeding the DAC or where an individual could receive a maximum intake of 12 DAC-hours per week are designated and regulated as Radiological Areas. Exposure of 12 DAC-hours per week for a work year (50 weeks) corresponds to a potential internal exposure to workers of 1,500 mrem (30% of 5,000 mrem/year). However, it must be emphasized that, although the worker protection limit is 5,000 mrem/year, exposures are actually a small fraction of the limit.

Areas not identified as Radiological Areas are designated as Nonradiological Areas. Nonradiological Areas do not present the potential for internal exposures to workers exceeding 100 mrem/year. Using appropriate 40 CFR 61 Appendix D emission factors and estimated dispersion factors, a very conservative factor of approximately 10^{-6} was assumed for estimating public doses from on-site occupational doses for the Oak Ridge Y-12 Plant, which is the facility closest to the public. Therefore, the air discharged from all Nonradiological Areas at each installation would not have the potential to cause a dose exceeding a maximum of 0.0001 mrem/year to the public. Even taking into account a factor of 4.4 for the difference in time of exposure between workers and residents, emissions for Nonradiological Areas could not contribute significantly to the total ORR dose estimate. For this reason, it is not necessary to evaluate Nonradiological Areas.

2.2 OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION

ORISE handles very small quantities of radionuclides in research and training activities conducted within laboratory hoods. Use of radionuclides is limited to three specific locations. ORISE maintains a rigid nuclear material accounting system for all radionuclide sources. In general, ORISE's total inventory of radionuclides has been less than the quantities specified in Table 1, Appendix E, to 40 CFR 61. Nevertheless, ORISE has demonstrated compliance with NESHAP for radionuclides by assuming that the entire annual inventory of radionuclides is exhausted through the laboratory hoods in gaseous form. With no adjustments for the emission factors for effluent controls, radiological decay, or control devices, the COMPLY code was used to model the estimated ORISE source term to ensure that potential emissions and resulting doses are below 0.1 mrem/year.

3. MAJOR SOURCE DESCRIPTION AND EMISSION MEASUREMENTS

For purposes of this compliance plan, a major source is a release point that has the potential to emit, during 1 year, radionuclides that can cause an individual member of the off-site public to receive an annual EDE greater than or equal to 0.1 mrem. Potential to emit is calculated using either stack sampling data or other estimation methods (described in Sect. 5 of this plan). When calculating "potential emissions," it is assumed that pollution abatement equipment does not exist but that the facility or process operations are otherwise normal. This definition is consistent with 40 CFR 61.93 (b)(4)(ii). Equipment that is integral to the proper operation of the process will not be considered abatement even though radionuclides may be removed by this equipment. In other words, if the process could not function as intended without the equipment, it is considered integral to the process and is be considered abatement equipment.

Title 40 CFR 61.93 (b)(4)(i) requires that all emission points with potential doses greater than or equal to 0.1 mrem/year be sampled continuously, as outlined in 40 CFR 61.93 (b)(1) and (2) or by an approved alternate method under 40 CFR 61.93 (b)(3). All major sources on the ORR are currently sampled continuously. Radionuclides that contribute 10% or greater of the resulting dose from each release point are analyzed. Summaries of the existing sampling systems at each installation are discussed in the following sections. (Additional details of the existing stack sampling systems for each installation are presented in Appendix A.)

The number of major sources may vary from year to year, depending upon operating hours of the process or processes involved and minor changes in the meteorological and wind rose data. It is important to note, however, that sources that change from minor to major do not necessarily constitute a modification under 40 CFR 61.15. As indicated in 40 CFR 61.15 (d)(2) and (3), increases in production rate and hours of operation are not considered modifications provided that they are accomplished without capital expenditure. In addition, as indicated in 40 CFR 61.96, an application for construction or modification is required only when the actual emissions, not potential emissions, are estimated to result in an increase in dose of 0.1 mrem or greater.

3.1 OAK RIDGE Y-12 PLANT

Each major source at the Y-12 Plant is equipped with similar constant-flow continuous samplers that use applicable methodologies specified by EPA and/or standards specified by American National Standards Institute (ANSI) N13.1-1969. Each sampling system consists of a multiple-point sample probe and filter. A thermal mass flow meter/controller downstream of the filter collector controls sample flow. The Y-12 Plant samplers are designed to provide a near-isokinetic sampling rate for each stack.

Stack flow rates are measured quarterly using EPA Method 2 found in Appendix A of 40 CFR Part 60. The quarterly flow rate measurements are then used to generate a rolling four-quarter average flow rate. Each of the four individual measurements is then compared to the rolling four-quarter average. A stack flow rate variability of less than $\pm$ 25 % of the most recent four-quarter average is defined to be within an acceptable range. For stacks where the last four recorded quarterly flow rate measurements remain within the acceptable range, the average stack flow rate is used to calculate emissions. Stacks that exhibit greater than $\pm$ 25 % variability in quarterly flow rate measurements are

penalized by using the maximum flow rate of the last four measurements to calculate the stack emissions.

Regardless of the stack flow variability, the average four-quarter stack velocity is used to calibrate the sampling systems to approximate isokinetic conditions. To maintain the near-isokinetic sampling rate, the sizes of the sampling probe nozzles are adjusted as needed after the quarterly EPA Method 2 velocity measurements. This technique was approved by EPA Region IV in a letter from W. A. Smith to DOE's R. R. Nelson dated July 15, 1992.

3.2 OAK RIDGE K-25 SITE

The K-25 Site has only one source, the Toxic Substances Control Act (TSCA) Incinerator, which has a potential for emissions with resulting doses above 0.1 mrem/year. Details of the sampling system were submitted to EPA Region IV on August 26, 1987, and approved in a letter from Mr. Winston Smith (EPA) to Joe Parks (DOE) dated October 2, 1987. The stack gas velocity is measured using a ratio of the exhaust fan motor current to differential pressure across the fan. Quarterly EPA Method 2 tests are conducted to verify that the method used for calculating velocity is properly calibrated. The system is designed to sample emissions at near-isokinetic rates using the continuous velocity data that are related to the fan motor current.

3.3 OAK RIDGE NATIONAL LABORATORY

Each major source at ORNL is equipped with similar constant-flow continuous samplers that use applicable methodologies specified by EPA and/or ANSI N13.1-1969. Each sampling system consists of a multiple-point sample probe and filter to capture radionuclide particulates. In addition to the radionuclide particulates, adsorbable gases (including radioiodine) are collected on activated charcoal; tritium is collected as tritiated water on indicating silica gel; and noble gases are measured using an online detector. A thermal mass flow meter/controller downstream of the filter collectors controls sample flow. The ORNL samplers are designed to provided a near-isokinetic sampling rate for each stack.

Stack flow rates are measured quarterly using EPA Method 2. The quarterly flow rate measurements are then used to generate a rolling four-quarter average flow rate. Each of the four individual measurements is then compared to the rolling four-quarter average. A stack flow rate variability of less than "25 % of the most recent four-quarters average is defined to be within an acceptable range. For stacks where the last four recorded quarterly flow rate measurements remain within the acceptable range the average stack flow rate is used to calculate emissions. Stacks that exhibit greater than "25 % variability in quarterly flow rate measurements are penalized by using the maximum flow rate of the last four measurements to calculate the stack emissions.

Regardless of stack flow variability, the average four-quarter stack velocity is used to calibrate the sampling systems to approximate isokinetic conditions. To maintain the near-isokinetic sampling rate, the sizes of the sampling probe nozzles are adjusted as needed after the quarterly EPA Method 2 velocity measurements. This technique was approved by EPA Region IV in a letter from W. A. Smith to DOE's R. R. Nelson dated July 15, 1992.

3.4 OAK RIDGE INSTITUTE OF SCIENCE AND EDUCATION

ORISE has no sources with potential emissions that could result in a dose of 0.1 mrem/year or greater to any member of the public.

4. MINOR SOURCE DESCRIPTION AND EMISSION MEASUREMENTS

For purposes of this compliance plan, a minor source is a release point or group of release points that has the potential to emit radionuclides that produce a dose of less than 0.1 mrem/year. It is stated in 40 CFR, Part 61.93 (b)(4)(i), "For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to verify low emissions." Thus, periodic emissions evaluation is required for all sources with potential radionuclide emissions with resulting doses less than 0.1 mrem/year. This section defines how compliance with the periodic confirmatory measurement requirement will be achieved.

The ORR has a large number of minor sources that could potentially release radionuclides. For example, the ORR has approximately 1600 laboratory hoods, many of which have the potential to release radionuclides. In addition, numerous other small potential sources, such as, but not limited to, tank vents, general building ventilation systems, and small machine shops, are located at each installation. Performing stack sampling on most of these small sources would be impractical and inaccurate. For example, many of these minor sources do not have ventilation systems that would permit obtaining a representative sample. Further, emissions rates from these small sources are extremely low; therefore, limitations on the analytical detection level would result in an overestimate of emission. For those minor sources, engineering estimates and other technically justified methods are used to periodically confirm that emissions are low.

As previously discussed in Sect. 2, areas to be evaluated for potential radionuclide emission sources are selected on the basis of existing worker protection programs. Those protection programs identify areas that require special controls to protect employees working in the area. These areas will be evaluated for potential radionuclide emissions to the environment. Areas not identified by these programs will not require evaluation because of their extremely low or nonexistent emission potential.

Because of the large number and diversity of minor sources at ORR, it is impractical to list each individual minor source on the annual report since these sources contribute insignificantly to off-site dose. Minor sources are grouped to reduce the administrative burden on estimating releases. For the purpose of estimating releases and submitting the annual report as required by Part 61.94, minor sources are grouped according to similar characteristics (e.g., general location, type of activity, or type of control). The minor sources are so grouped that the estimated actual doses resulting from any one group does not exceed 0.1 mrem/year. The listing of each group will include a description and an estimate of the number of release points or sources in the group, the type of controls, and the distance to the critical receptor.

Many minor radionuclide sources do not have dedicated ventilation systems. Emissions enter the air inside the building before being exhausted through the general building ventilation system. The release point is the building ventilation system, not the individual sources or processes within the building.

Actual emissions from radionuclide sources are estimated using any one or a combination of the methods described in the following sections. The method chosen is dependent upon the type of minor source or group of sources and the availability of required data. Generally speaking, the methods of estimating releases will overestimate emissions of radionuclides. Documentation of all estimates is maintained by the respective installation.

4.1 CONTINUOUS STACK SAMPLING

Continuous stack sampling systems are currently located on all known major sources. In some cases, stack sampling systems are also installed on minor sources either permanently or during a representative sampling period. Although sampling systems for minor sources are not required for regulatory purposes, the data will be used for estimating emissions. Continuous sampling systems on minor sources use the same methodologies as the major sources, which are specified by EPA and/or ANSI N13.1-1969.

4.2 PERIODIC GRAB SAMPLING

In some instances, periodic grab samples from minor sources may be collected to estimate emissions. The grab sampling for minor sources will generally comply with EPA Methods 1 through 5 in Appendix A of 40 CFR Part 60. However, since these methods were developed primarily for sampling effluent streams with large particulate loadings (i.e., steam plants), several modifications to Method 5 are necessary.

First, nitric acid is used instead of acetone to wash the sample probe for uranium analyses. Nitric acid is much more effective than acetone in dissolving uranium. For example, Step 5.2.2 of EPA Method 12 also specifies the use of nitric acid for probe cleaning during lead sampling. The probe liner will be a seamless tubing constructed of quartz glass, borosilicate, or metal.

Another exception to Method 5 is that the first two impingers will contain nitric acid instead of water to adsorb any uranium that may inadvertently pass through the filter. For sources where technetium may be present, two additional impingers containing sodium hydroxide and hydrogen peroxide are also used. The impingers and associated glassware will be washed with the impinger contents to ensure that any contaminants trapped in the glassware are recovered for analysis.

Method 5 makes several references to heating the probe and filter to prevent condensation in the sample train. Since sources sampled are typically at ambient temperature and humidity, condensation is not a problem in these applications. However, the probe and filter are heated at or above the stack temperature to prevent condensation. In no case does the temperature reach above 134EC. This approach is consistent with Step 4.1.3 of EPA Method 104 for beryllium sampling found in Appendix B of CFR Part 61.

Although it is not a modification to Method 5 per se, the samples are analyzed using one of the referenced methods in EPA Method 114 rather than gravimetric determinations that are typically used for total particulate matter. Details of the analytical technique and any deviations from standard methodology are discussed in each installation's QA Plan, as required by 40 CFR Part 61, Appendix B, Method 114.

4.3 MODIFIED STACK SAMPLING

For minor modifications to established methodologies other than those specified previously, EPA approval is obtained from documented telephone conversations. More significant deviations may require written EPA approval.

If sampling is conducted upstream of the pollution abatement equipment, the actual emissions may be estimated by applying the estimated efficiency of the abatement equipment. However, in this situation, EPA approval will be obtained on a case-by-case basis (i.e., via documented telephone conversations).

4.4 HEALTH PHYSICS DATA

Ongoing worker protection programs to comply with safety and health regulations and DOE orders dictate that personnel and/or work area air samples be taken on a periodic basis in selected areas. Where available, these data, along with estimated room air exchange rates, is used to estimate releases of radionuclides. For example, this approach may be used for general room ventilation systems serving uranium process areas, development and laboratory operations, and waste management operations. Emissions are typically overestimated using this method because samplers are located close to the operation with the potential to generate airborne contamination. Measured airborne concentrations are therefore higher than the levels expected in the general room air because the effects of dilution are omitted. Where “less than” levels are reported because of analytical detection limits, the detection limit is used to calculate emissions. This practice also overestimates emissions.

4.5 RADIONUCLIDE INVENTORY DATA

In most cases, research and development laboratories maintain records of various isotopes purchased, used, and stored. These amounts are generally very small. Further, most of the radioactive material is consumed and/or absorbed in the experiment or discarded as liquid or solid waste; therefore, emissions are extremely small. From these data, a mass balance approach can be used to make an estimate of annual emissions.

4.6 ENGINEERING ESTIMATES AND JUDGMENT

Engineering estimates and judgment and other calculations based upon engineering and science fundamentals are also used to estimate emissions. As additional calculation methodologies are identified, EPA will be contacted by telephone to obtain approval of the methodology. In the event that the methodology is complex and EPA desires additional information, a written request for approval for the alternative method will be submitted.

Listed below are specific methods employing engineering estimates and judgment that EPA has approved:

Tank Evaporation Method

In some cases, wastewater tanks may contain low levels of radioactive material. Emissions may be estimated by calculating the expected evaporation rate of water and assuming that the radionuclides are emitted in the evaporated water at the same concentration they are found in the water. In actuality, this approach overestimates emissions since the dissolved and suspended radioactivity will likely concentrate in the liquid phase rather than be emitted in the gaseous phase.

Modification to Appendix D

Appendix D of 40 CFR 61 is used to estimate emissions of radioactive material during processing. It assumes that any radioactive material heated above 100EC is completely vaporized and emitted to the atmosphere (i.e., emission factor = 1.0). This is an overly conservative assumption for elemental uranium since the melting and boiling points are 1132EC and 3818EC, respectively. To compensate for the extremely high melting and boiling points, an emission factor of 1 is used for uranium heated above 3000EC. An emission factor of $10G^{3}$ is used for uranium heated above 1100EC but less than 3000EC. An emission factor of $10G^{6}$ is used when the uranium is at ambient temperature or is heated below 1100EC. The modified emission factors are used for elemental uranium provided that no reaction takes place to alter its chemical form. This modification to Appendix D was approved by EPA Region IV in a letter from W. A. Smith to DOE's R. R. Nelson dated December 21, 1992.

Performance Testing of New Processes

When new processes are begun, performance testing may be conducted to ensure that the process is functioning properly. A portion of the performance test may include stack sampling using EPA Methods 1 through 5 or approved alternatives. The emission data obtained during the performance test may be correlated to other process parameters such as process feed rate. When these correlation data are available, emission estimates can be made using data on the process parameters. For example, an emission factor in terms of mass of emissions per mass of feed may be developed. The correlation data will be available for EPA review.

Surrogate Emissions

In some cases, emission estimates obtained for one source are used as surrogate emission estimates for other similar sources in lieu of conducting a separate emissions estimate. In this case, care is taken to ensure that the surrogate emission estimate is representative or results in overestimation of emissions from the source being evaluated. This approach was approved by EPA Region IV in the June 9, 1993, letter from W.A. Smith to R. R. Nelson for the 1992 annual report for certain emission points located at ORNL. This method is used only after approval by EPA on a case-by-case basis.

4.7 APPENDIX D OF Part 61

Appendix D of Part 61 defines a very conservative method of estimating emissions from processes. Although this procedure is intended to estimate emissions of new sources for purposes of determining reporting requirements under 40 CFR 61.96, it may also be used for existing sources when other, more accurate methods are not feasible or available.

4.8 HIGH EFFICIENCY PARTICULATE AIR FILTER SAMPLING

High efficiency air particulate (HEPA) filters are routinely used at each of the ORR facilities as abatement equipment for radionuclide emissions. Many HEPA filters are replaced at least once per year. The filter media from these used filters can then be analyzed to determine the quantity of radionuclides collected. HEPA filter sampling is a very effective technique on minor sources since the 99.97 % particulate collection efficiency and long sampling time, which concentrate the sample for laboratory analysis.

The sampling method includes taking two representative samples from the cross-section of the HEPA filter. Each sample is analyzed for isotopes of interest. The activity on the HEPA filter is then calculated by using the activity from the samples as shown below:

$$\textit{Total HEPA Activity} = \frac{\textit{(Activity of the Sample)}}{\textit{(Area Sampled)}} \times (\textit{Total HEPA Area}).$$

Because the efficiency of the HEPA is 99.97 %, the remaining activity on each filter is 99.97 % of the potential activity for the source. Therefore, the source's potential emissions (without abatement equipment while otherwise operating normally) would be equivalent to the activity on the filter divided by 0.9997. The total emissions from the source with HEPA abatement method would be 0.03 % of the sources's potential emissions (without abatement). This sampling method was approved by EPA Region IV in a letter from J. A. Harper to DOE's R. R. Nelson dated September 17, 1992. As specified in that letter, "EPA approval will be obtained on a case-by-case basis (i.e., via documented telephone conversations)" whenever this sampling method is used.

4.9 FREQUENCY OF MEASUREMENTS

New emission estimates are generated each year for all minor sources except for sources where grab sampling, HEPA filter sampling., or surrogate emissions are used. Confirmation of low emissions from these sources are revised at least every 5 years depending upon the variability of the source and the potential emissions. However, the operational activities of these source areas are reviewed annually to ensure there are no significant changes that could increase emissions.

5. METHODS OF ESTIMATING POTENTIAL DOSE

An estimate of potential emissions and resulting dose is needed for two reasons: (1) to determine which sources require continuous sampling as required by 40 CFR 61.93 and (2) to determine which sources require reporting as a major source in the annual report. The methods for estimating potential releases are essentially equivalent to the methods above for estimating actual releases. However, for purposes of estimating potential releases, no consideration is given to pollution abatement equipment. The equation below shows the relationship between actual emissions and potential emissions as a function of pollution abatement removal efficiency, where the efficiency is expressed as a decimal:

$$\textbf{\textit{Potential Emissions}} = \frac{\textbf{\textit{Actual Emissions}}}{\textbf{\textit{(1 – Removal Efficiency)}}}\ .$$

Removal efficiencies are estimated using Table 1 of Appendix D of Part 61 or other documented methods, including, but not limited to, pollution abatement manufacturer's data and stack sampling data.

5.1 APPENDIX E OF PART 61

Although Appendix E can be used, in some cases, to verify that groups of small emitting sources do not have emissions with resulting doses greater than 0.1 mrem/year. The annual quantities in Table 1 of Appendix E were based on extremely conservative assumptions enabling the use of this method to demonstrate that small sources are not subject to continuous sampling requirements of Part 61.93(b).

In addition to the annual use quantities in Table 1, the COMPLY computer code referenced in Appendix E is also used to demonstrate that sources have potential doses below 0.1 mrem/year. However, the COMPLY code is not be used to determine compliance with the off-site dose standard found in 40 CFR 61.92.

5.2 DOSE-TO-SOURCE TERM RATIO METHOD

In some cases, doses may be estimated by using the dose-to-source term ratio method. For each installation, a factor is calculated to estimate potential doses for individual sources in the current year. This factor is calculated by taking the highest value of the quotient of annual dose divided by annual emissions of the last 3 years. The potential source term for the current year is calculated without any consideration of abatement equipment. The following formula is used:

$$Potential\ Dose\,(mrem/year) = \frac{Dose\,(mrem)}{Source\,Term\,(Ci)}\ x\ [Potential\ Source\,Term\,(Ci)],$$

where dose (mrem)/source term (Ci) is the maximum value for the past 3 years. If the estimated potential dose calculated with the above formula is greater than 0.05 mrem/year, the EPA-approved CAP-88 model will be used to verify the potential dose.

5.3 BACK-CALCULATION OF POTENTIAL SOURCE TERM

Potential doses are typically calculated by estimating a potential source term (curies) and then modeling the source term to estimate off-site concentration and resulting dose (millirems per year). However, using the same modeling approach, it is possible to back-calculate the required potential source term that would be necessary to deliver an off-site dose of 0.1 mrem/year. After the potential source term is calculated, one of the methods previously discussed can be used to demonstrate that the source's potential emissions are below the source term required for an off-site dose of 0.1 mrem/year.

5.4 ADMINISTRATIVE PROCEDURES

Where administrative procedures are in place, they may be used to demonstrate that potential emissions from certain operations are extremely low. For example, an internal administrative procedure at ORNL allows only certain radionuclides within specific limits to be used in specific categories of laboratory hoods. Using the radionuclide with the highest dose conversion factor and the maximum allowed quantity, a worst-case dose can be calculated. These results can be used to demonstrate that no single laboratory hood will produce emissions that will result in an off-site dose greater than 0.1 mrem/year. Other similar procedures and calculations may be used where available.

6. COMPUTER DISPERSION MODELING AND DOSE ASSESSMENT

All radiation dose calculations, for comparison against the dose standard in 40 CFR 61.92, are performed using the EPA-recommended CAP-88 computer codes. This package features a slightly modified version of the AIRDOS-EPA computer code, which implements a steady-state, Gaussian plume, atmospheric dispersion model and Nuclear Regulatory Commission (NRC) Regulatory Guide 1.109 food chain models. The package also contains the radionuclide database and dose conversion factors prescribed by the EPA for use with the CAP-88 models. As indicated in Sect. 5, other models and methods may be used to estimate potential emissions for compliance with administrative provisions of the regulations.

The EDE to the maximally exposed individual for ORR is determined by (1) identifying receptors (residences, businesses, or schools) around the ORR that could be subject to the highest radionuclide concentrations, (2) calculating the dose to a person located at each of the identified receptors, and (3) selecting the person with the highest calculated dose resulting from the combined emissions from all ORR facilities.

Site-specific parameter values are used, if possible, in all calculations. If site-specific data are unavailable, default values suggested in the CAP-88 codes, NRC Regulatory Guide 1.109, or the NESHAP background information documents are used. The following parameters are expected to have measured, site-specific values: release point parameters (e.g., stack height and diameter, gas exit velocity and temperature, nuclide-specific annual releases, and, if known, nuclide-specific parameters such as particle size, chemical form, or solubility); distances from sources to receptors; and current-year meteorological and climatological data. Multiple release points are collocated, if such collocation does not alter significantly the distance from source to receptor. Some release points are combined using the combination rules in “Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10: Procedures for Evaluating Air Quality Impact of New Stationary Sources” (EPA/450/4-77-001). An exception is at the Y-12 Plant, where all sources are combined into a single source and assumed to be 20 m high with no exit velocity. This combination of sources was recommended by EPA Region IV in a letter from Charles Phillips to DOE's B. J. Davis dated January 25, 1985. An evaluation has been made of source modeling options for the Y-12 Plant. Results indicate that doses to the public, calculated using the single source representation, are an average of 30% higher than doses using the actual emission points.

Foodstuff production and consumption is treated according to specific guidelines: State-specific foodstuff production rates provided with CAP-88 are used. With regard to food consumption by the maximally exposed individual, the rural consumption pattern given in the background information document is used unless local conditions dictate a different pattern.

7. ANNUAL REPORTING

As required by 40 CFR 61.94, annual reports are submitted to EPA by June 30 of each year. Appendix B includes a blank copy of the forms that are submitted to EPA for compliance with this requirement.

Individual release points are listed on the report for major sources (i.e., those with potential emissions resulting in doses greater than or equal to 0.1 mrem/year). Minor sources are grouped, as outlined in Sect. 4., and listed accordingly. For each grouped source, the estimated number of release points included in the group is listed. For major and grouped sources, the type of control device, its efficiency, and the distance to the most affected receptor is provided.

As required by Part 61.94 (8), a list of all construction and modifications completed during the reporting year for which approval to construct or modify was waived under Part 61.96 is provided in the annual report.

8. QUALITY ASSURANCE PLANS

As a commitment item of the FFCA and as required in 40 CFR, Part 61, Subpart H, each ORR facility submitted a QA Plan to EPA Region IV. EPA subsequently acknowledged that the submittals satisfied the requirements in 40 CFR, Part 61, Method 114, for QA Plans. Method 114 specifies that a QA Plan must ensure that the emission measurements are representative, are of known precision and accuracy, and include administrative controls to ensure prompt response when emission measurements indicate an increase over normal radionuclide emissions rates.

Each site's QA Plan references site procedures that are specific to the radionuclide emission measurements for NESHAP compliance. Over time, the site procedures may be revised, but the QA Plans will not be reissued to reflect minor changes in the procedures. However, the updated QA Plans and site procedures will be maintained by the Environmental Management Organizations at each facility and are available for inspection.

APPENDIX A-1

DETAILED STACK SAMPLING DESCRIPTIONS FOR THE OAK RIDGE Y-12 PLANT

Table A-1. Stack Sampling System Description
(Oak Ridge Y-12 Plant)

STACK NUMBER: ALL Y-12 PLANT STACKS

Item Description/Requirement	Response
1. How is stack gas velocity measured? 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(I) & (ii) - Reference Method 2 of Appendix A, Part 60, shall be sued to determine velocity and volumetric flow rates for stacks and large vents, and Method 2A shall be used for small ducts and vents.	The Y-12 Plant uses the reference methods.
2. Location of sample flow device. ANSI N13.1, 5.2.2.1.7(3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector.	A thermal mass flow meter/controller is used downstream of the filter collector.
3. Frequency of stack flow measurements. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(iii) - The frequency of the flow rate measurement shall depend upon the variability of the effluent flow rate. For variable flow rates, continuous of frequent flow rate measurements shall be made. For relatively constant flow rates, only periodic measurements are necessary.	The flows are measured on a quarterly basis.
4. Calibration frequency.	The equipment is calibrated quarterly and after maintenance activity.
5. Are the samples collected isokinetically? ANSI N13.1, 4.2.2.3 - When particles larger than 5 Fm are anticipated, it is recommended that the sampler arrangement be designed to permit near-isokinetic flow in the sampler entry probe.	The Y-12 samplers are designed to provide a near-isokinetic rate for each stack.
6. If the material of concern is in the form of gas(es) or vapor(s), do the sample transport lines have no significant leakage or loss of material? For consistency with EPA Method 5, significant leakage is any leakage rate in excess of either 4% of the average sampling rate or 0.02 ft^3/min, whichever is less.	Leak tests are performed on a quarterly basis on all regulated Y-12 Plant stack sampling systems.
7. Is the sample transport line as abort as possible? ANSIS N13.1, Appendix A - Long sample delivery lines should be avoided.	The continuous breakthrough monitors have sample delivery lines of about 2 ft, while the continuous samplers have the filters immediately in back on of the probe.
8. Do all bends in the sample transport lines have a radii of curvature greater than five tube diameters? ANSI N13.1, Appendix B B5 - Elbows in sampling lines should be avoided if possible, but, when required, the bend radius of the elbow should be as long as possible.	Yes.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-1 (Continued)

Item Description/Requirement	Response
9. Is the sample transport line insulated or heat traced, where applicable? ANSI N13.1, 4.2.4 - When heavy moisture loadings are anticipated, heated sampling lines will be required to prevent condensation in the lines and to raise the collector temperature well above the dewpoint.	Yes.
10. Does the sampler fractionate by particle size? ANSI N13.1, 4.2.2.1 - The sampler must not fractionate by particle size or in other ways distort the physical and chemical properties of the airborne radioactive constituents.	This point is addressed in the overall design of the Y-12 continuous monitoring system as illustrated by the following: location and number of sampling points, design of probe nozzles, near-isokinetic sampling rate, short sample lines, periodic washing of sample lines and probes, and the use of heat tracing. These design factors assure representative samples.
11. Is the particulate retention in the sample transport line evaluated? ANSI N13.1, Appendix B B1 - Where sampling delivery lines are required, an evaluation should be made of deposition in these lines.	Y-12 washes the sample probes and analyzes the washings to determine sample retention. The result of the washings analysis are evaluated on a quarterly basis, and the data are added to the annual emission calculation.
12. Is the sample probe removable? ANSI N13.1, Appendix A A3.4 - Sampling Probe Configuration in Fig. A2 and A5. A common feature of the probes is the provision for removing them readily for replacement, cleaning, or evaluating the deposition losses.	Yes.
13. Does the sample location comply with EPA Method 1 and ANSI N13.1, 4.2.1.2? EPA Method 1, 2.1 - Sampling or velocity measurement is performed at a site located at least eight stack or duct diameters downstream and two duct diameters upstream from any flow disturbances. If necessary, an alternative location may be selected at a position at least two stack or duct diameters downstream and a half diameter upstream. ANSI N13.1, 4.2.1.2 - The sampling point should be a minium of five duct diameters downstream from abrupt changes in flow direction or prominent transitions.	The Y-12 samplers meet the criteria of Method 1 but in a few cases may not meet the more stringent ANSI N13.1 criteria.
14. Does the probe have the correct number of nozzles with each nozzle properly located? ANSI N13.1, Appendix A A3(1) - Enough points in the cross section are sampled. (2) The velocity and flow distribution in the duct at the cross section should be known. (3) Each withdrawal point in circular ducts should be centered in an equal annular area of size equal to the cross-sectional area divided by the number of probe nozzles. Square and rectangular ducts should be sampled from points in the cross section presenting approximately equal area.	Yes, the monitors use probes that have two to six sampling nozzles depending on stack diameter. Each nozzle is centered in an equal annular area of size equal to the cross-sectional area divided by the number of probe nozzles.
15. Are the nozzle(s) seamless SS (316) tubing with sharp tapered edges with the angle of taper 30E and the taper on the outside edge?	Yes.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-1 (Continued)

Item Description/Requirement	Response
16. Does the air-moving system for the sampler meet the requirements? ANSI N13.1, 5.2.2.1.7 (2) - The prime requirement is that the air mover deliver the necessary air flow against the resistance of the sampling system.	Yes.
17. How is the sample flow measured? ANSI N13.1, 5.2.2.1.7 (3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector. ANSI N13.1, 5.2.2.1.7 (4) - Provisions must be made for adjusting the sampling rate to the required value.	The monitors use a thermal mass flow meter/controller downstream of the filter collector. The arrangement maintains a constant flow rate that will not deviate with the grain loading. This Assures a continuos near-isokinetic sampling rate.
18. What is the sampling period?	One day minimum, seven days maximum, depending on stack size and grain loading.
19. What is the collection media used?	Whatman 41 cellulose filter with a collection efficiency of 95% for a 0.3-Fm dioctyl phthalate smoke particle at the face velocity used. According to EPA-600/2-80-203, the Whatman 41 filter has a collection efficiency of about 50% for a 0.03-Fm sodium chloride particle.
20. List analytical methods used for the sample analysis. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(2)(iii) - Radionuclides shall be collected and measured using procedures based on the principles of measurement in Appendix B, Method 114.	The Y-12 Plant uses Method A-5 in Method 114 of 40 CFR 61.10.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

APPENDIX A-2

DETAILED STACK SAMPLING DESCRIPTIONS
FOR THE
OAK RIDGE K-25 SITE

Table A-2. Stack Sampling System Description
(Oak Ridge K-25 Site)

STACK: K-1435 TSCA Incinerator

Item Description/Requirement	Response
1. How is stack gas velocity measured? 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(I) & (ii) - Reference Method 2 of Appendix A, Part 60, shall be used to determine velocity and volumetric flow rates for stacks and large vents, and Method 2A shall be sued for small ducts and vents.	This system uses a ration of fan motor current to differential pressures across the fan to determine stack gas velocity. This system is calibrated with EPA Method 2.
2. Location of sample flow device. ANSI N13.1, 5.2.2.1.7(3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector.	The sample flow measuring instrument is located and flow rates are measured downstream of the filter collector.
3. Frequency of stack flow measurements. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(iii) - The frequency of the flow rate measurement shall depend upon the variability of the effluent flow rate. For variable flow rates, continuous of frequent flow rate measurements shall be made. For relatively constant flow rates, only periodic measurements are necessary.	The fan motor current and pressure differential are continuously measured. The stack velocity indicator is calibrated by EPA Method 2 quarterly.
4. Calibration frequency.	The gas meter on the continuous sampling train is calibrated at least monthly and after maintenance. Additional equipment is calibrated at least annually.
5. Are the samples collected isokinetically? ANSI N13.1, 4.2.2.3 - When particles larger than 5 Fm are anticipated, it is recommended that the sampler arrangement be designed to permit near-isokinetic flow in the sampler entry probe.	The continuous sampler is near isokinetic.
6. If the material of concern is in the form of gas(es) or vapor(s), do the sample transport lines have no significant leakage or loss of material? For consistency with EPA Method 5, significant leakage is any leakage rate in excess of either 4% of the average sampling rate or 0.02 ft^3/min, whichever is less.	Leak checks are performed per EPA Method 5 weekly.
7. Is the sample transport line as abort as possible? ANSIS N13.1, Appendix A - Long sample delivery lines should be avoided.	The sample line to filter is approximately 1 ft. The sample line to impingers is as short as possible (acceptable to EPA Method 5).
8. Do all bends in the sample transport lines have a radii of curvature greater than five tube diameters? ANSI N13.1, Appendix B B5 - Elbows in sampling lines should be avoided if possible, but, when required, the bend radius of the elbow should be as long as possible.	To reduce the impaction of particles on the tubing walls, no bends are in the tubing between the nozzle and the filter. Once the filterable material has been removed, short straight runs of tubing are not required.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-2 (Continued)

Item Description/Requirement	Response
9. Is the sample transport line insulated or heat traced, where applicable? ANSI N13.1, 4.2.4 - When heavy moisture loadings are anticipated, heated sampling lines will be required to prevent condensation in the lines and to raise the collector temperature well above the dewpoint.	The sample transport line is heated and enclosed. Water does condense and is collected from the line prior to the impingers and analyzed.
10. Does the sampler fractionate by particle size? ANSI N13.1, 4.2.2.1 - The sampler must not fractionate by particle size or in other ways distort the physical and chemical properties of the airborne radioactive constituents.	The sampler does not fractionate by particle size.
11. **Is the particulate retention in the sample transport line evaluated?** ANSI N13.1, Appendix B B1 - Where sampling delivery lines are required, an evaluation should be made of deposition in these lines.	The probe to the filter collector is brushed and rinsed with acid weekly, and the rinse is analyzed with the sample.
12. Is the sample probe removable? ANSI N13.1, Appendix A A3.4 - Sampling Probe Configuration in Fig. A2 and A5. A common feature of the probes is the provision for removing them readily for replacement, cleaning, or evaluating the deposition losses.	Yes.
13. Does the sample location comply with EPA Method 1 and ANSI N13.1, 4.2.1.2? EPA Method 1, 2.1 - Sampling or velocity measurement is performed at a site located at least eight stack or duct diameters downstream and two duct diameters upstream from any flow disturbances. If necessary, an alternative location may be selected at a position at least two stack or duct diameters downstream and a half diameter upstream. ANSI N13.1, 4.2.1.2 - The sampling point should be a minium of five duct diameters downstream from abrupt changes in flow direction or prominent transitions.	Yes.
14. Does the probe have the correct number of nozzles with each nozzle properly located? ANSI N13.1, Appendix A A3(1) - Enough points in the cross section are sampled. (2) The velocity and flow distribution in the duct at the cross section should be known. (3) Each withdrawal point in circular ducts should be centered in an equal annular area of size equal to the cross-sectional area divided by the number of probe nozzles. Square and rectangular ducts should be sampled from points in the cross section presenting approximately equal area.	No, the system has only one sample nozzle located at 14.6% of stack diameter from the inside wall. The sample nozzle is located within the average stack velocity. During EPA Method 2 calibration, six points, each across two traverses, are done. EPA Method 2 confirms the location of the average velocity.
15. Are the nozzle(s) seamless SS (316) tubing with sharp tapered edges with the angle of taper 30E and the taper on the outside edge?	Yes.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-2 (Continued)

Item Description/Requirement	Response
16. Does the air-moving system for the sampler meet the requirements? ANSI N13.1, 5.2.2.1.7 (2) - The prime requirement is that the air mover deliver the necessary air flow against the resistance of the sampling system.	The specifications for the pump, using EPA Method 5 criteria, are met.
17. How is the sample flow measured? ANSI N13.1, 5.2.2.1.7 (3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector. ANSI N13.1, 5.2.2.1.7 (4) - Provisions must be made for adjusting the sampling rate to the required value.	The sampling flow is automatically controlled by the electronic feedback from the fan motor current. Twice a day, sample flow rates are recorded.
18. What is the sampling period?	The sampling period is once per week.
19. What is the collection media used?	The filter meets the specifications in EPA Method 5. Impingers consist of (a) dilute nitric acid and (b) dilute sodium hydroxide.
20. List analytical methods used for the sample analysis. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(2)(iii) - Radionuclides shall be collected and measured using procedures based on the principles of measurement in Appendix B, Method 114.	A list of analytical methods is provided in the K-25 Quality Assurance Plan.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

APPENDIX A-3

DETAILED STACK SAMPLING DESCRIPTIONS FOR THE OAK RIDGE NATIONAL LABORATORY

Table A-3. Stack Sampling System Description
(Oak Ridge National Laboratory)

STACK NUMBER: 2026, 3020, 3039, and 7911

Item Description/Requirement	Response
1. How is stack gas velocity measured? 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(I) & (ii) - Reference Method 2 of Appendix A, Part 60, shall be used to determine velocity and volumetric flow rates for stacks and large vents, and Method 2A shall be sued for small ducts and vents.	Velocity profiles are conducted using EPA Method 2.
2. Location of sample flow device. ANSI N13.1, 5.2.2.1.7(3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector.	The sample flow measuring devices are located downstream of the collector.
3. Frequency of stack flow measurements. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(1)(iii) - The frequency of the flow rate measurement shall depend upon the variability of the effluent flow rate. For variable flow rates, continuous of frequent flow rate measurements shall be made. For relatively constant flow rates, only periodic measurements are necessary.	Velocity profiles are completed each quarter.
4. Calibration frequency.	At a minimum, an annual calibration check is completed on the mass flow meters, totalizers, and detectors. Also, the calibration is rechecked after any maintenance that would affect the equipment.
5. Are the samples collected isokinetically? ANSI N13.1, 4.2.2.3 - When particles larger than 5 Fm are anticipated, it is recommended that the sampler arrangement be designed to permit near-isokinetic flow in the sampler entry probe.	The sampling systems are set to collect samplers isokinetically. The flow rates are adjusted as needed after flow measurements have been completed to ensure that the samplers are operating isokinetically.
6. If the material of concern is in the form of gas(es) or vapor(s), do the sample transport lines have no significant leakage or loss of material? For consistency with EPA Method 5, significant leakage is any leakage rate in excess of either 4% of the average sampling rate or 0.02 ft^3/min, whichever is less.	The sampling system is leak checked annually. Additional leak checks may be performed to reestablish the integrity of the system if a violation to the system has occurred.
7. Is the sample transport line as abort as possible? ANSIS N13.1, Appendix A - Long sample delivery lines should be avoided.	All sample transport lines are as short as possible with the exception of 2026. The 2026 sample line is 35 ft. long; however, the line is cleaned annually and the rinsate analysis is included in the emission calculations.
8. Do all bends in the sample transport lines have a radii of curvature greater than five tube diameters? ANSI N13.1, Appendix B B5 - Elbows in sampling lines should be avoided if possible, but, when required, the bend radius of the elbow should be as long as possible.	The bends in the sample transport line comply with the standard.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-3 (Continued)

Item Description/Requirement	Response
9. Is the sample transport line insulated or heat traced, where applicable? ANSI N13.1, 4.2.4 - When heavy moisture loadings are anticipated, heated sampling lines will be required to prevent condensation in the lines and to raise the collector temperature well above the dewpoint.	The sample transport lines are heat traced where needed.
10. Does the sampler fractionate by particle size? ANSI N13.1, 4.2.2.1 - The sampler must not fractionate by particle size or in other ways distort the physical and chemical properties of the airborne radioactive constituents.	The sampler does not fractionate particles
11. Is the particulate retention in the sample transport line evaluated? ANSI N13.1, Appendix B B1 - Where sampling delivery lines are required, an evaluation should be made of deposition in these lines.	Each sampling probe and connected tubing prior to the particulate filter is removed annually from the stack and cleaned. The probe wash is submitted to the laboratory for analysis, and the results are incorporated in the emission calculations.
12. Is the sample probe removable? ANSI N13.1, Appendix A A3.4 - Sampling Probe Configuration in Fig. A2 and A5. A common feature of the probes is the provision for removing them readily for replacement, cleaning, or evaluating the deposition losses.	The sample probes are removable.
13. Does the sample location comply with EPA Method 1 and ANSI N13.1, 4.2.1.2? EPA Method 1, 2.1 - Sampling or velocity measurement is performed at a site located at least eight stack or duct diameters downstream and two duct diameters upstream from any flow disturbances. If necessary, an alternative location may be selected at a position at least two stack or duct diameters downstream and a half diameter upstream. ANSI N13.1, 4.2.1.2 - The sampling point should be a minium of five duct diameters downstream from abrupt changes in flow direction or prominent transitions.	The locations meet, at a minium, the EPA Method 1 requirement.
14. Are the nozzle(s) seamless SS (316) tubing with sharp tapered edges with the angle of taper 30E and the taper on the outside edge?	The nozzles are constructed of stainless steel tubing which may or may not be 316.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

Table A-3 (Continued)

Item Description/Requirement	Response
16. Does the air-moving system for the sampler meet the requirements? ANSI N13.1, 5.2.2.1.7 (2) - The prime requirement is that the air mover deliver the necessary air flow against the resistance of the sampling system.	The air-moving system meets the requirements.
17. How is the sample flow measured? ANSI N13.1, 5.2.2.1.7 (3) - The flow rate must be measured, and the flow measuring instrument should be located downstream of the filter collector. ANSI N13.1, 5.2.2.1.7 (4) - Provisions must be made for adjusting the sampling rate to the required value.	The sample flow rate is continuously measured using a thermal mass flow meter with totalizer located downstream from the collector.
18. **What is the sampling period?**	Samples are routinely collected over a one-week period. The sampling period may vary slightly throughout the year, especially around the holidays. The particulate filters are composited on a quarterly basis for isotopic analysis to achieve better detection limits.
19. What is the collection media used?	The radionuclide particulates are collected on a borosilicate glass filter with a retention efficiency of 99.985%, adsorbable gases (including radioiodine) are collected on activated charcoal, tritium is collected as tritiated water on indicating silica gel, and noble gases are measured using an on-line detector.
20. List analytical methods used for the sample analysis. 40 CFR 61.10, Subpart H, Sect. 61.93 (b)(2)(iii) - Radionuclides shall be collected and measured using procedures based on the principles of measurement in Appendix B, Method 114.	The procedures used for sample analysis are A-1, A-4, A-5, B-3, B-4, B-5, And G-1 form EPA Method 114, Appendix B.

References: (1) 40 CFR 60, Appendix A, (2) American National Standards Institute (ANSI) N13.1-1969 (R1982)

APPENDIX B

ANNUAL REPORTING FORMAT

U.S. Department of Energy
Air Emissions Annual Report
(Under Subpart H, 40 CFR 61.94)
Calendar Year 1990

Site Name: _____

_____

Operations Office Information

Office: _____

_____

_____

_____

Contact: _____ Phone:_____

_____

Site Information

Operator: _____

_____

Address: _____

_____

_____

Contact: _____ Phone:_____

_____

Section I. Facility Information

Site Description

Source Description

Section II. Air Emissions Data

Point Source	Type Control	Efficiency	Distance to Receptor

Grouped Source	Type Control	Efficiency	Distance to Receptor

Radionuclide	Annual Quantity (Ci)

Section III. Dose Assessments

Description of Dose Model

Summary of Input Parameters

Compliance Assessment

Effective Dose Equivalent:_____(mrem)

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. (See 18 U.S.C. 1001).

Name:_____

Signature:_____ Date:_____

APPENDIX C

COMPLIANCE PLAN ADDENDUMS

ADDENDUM C.1 Monitoring for Fugitive and Diffuse Sources

Regulations pursuant to Title 40 Code of Federal Regulations (CFR) Part 61, Subpart H, require Department of Energy (DOE) facilities to identify and quantify emissions from radionuclide point sources. However, the regulations do not define requirements for reporting and estimating emissions from fugitive and diffuse sources. Further, documented and proven methods that can accurately and selectively estimate emissions from individual fugitive and diffuse sources are not available. A guidance letter from Winston A. Smith, Environmental Protection Agency (EPA) Region IV, to R. R. Nelson, DOE Oak Ridge Operations (ORO), on March 24, 1992[1], allowed the use of environmental measurements such as ambient air monitoring to confirm compliance for fugitive and diffuse sources as long as this methodology was "coordinated between DOE and EPA." In response to the March 24, 1992 letter and an EPA visit to the Oak Ridge Reservation (ORR) in April 1992, a plan was developed by DOE-ORO to confirm compliance for fugitive and diffuse sources by measuring atmospheric concentrations of radionuclides at critical receptor locations using a network of ambient air monitors around the ORR. This plan was submitted to EPA headquarters October 28, 1992[2] and was implemented January 1993. Effective Dose Equivalent (EDE) values calculated from the environmental measurements have been provided to EPA as supplementary information in the ORR Annual Radionuclide Air Emissions Report since 1992 consistent with the Memorandum of Understanding between DOE and EPA Headquarters[3, 4].

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[1]Letter, Winston A. Smith, Director Air, Pesticides and Toxics Management Division, EPA Region IV, to R. R. Nelson, DOE Oak Ridge Operations, "Fugitive Radionuclides Air Emissions From Doe Facilities," March 24, 1992.

[2]Letter, R.R. Nelson of DOE to Winston A Smith of EPA, "Fugitive Radioactive Air Emissions from DOE Facilities," Attachment, "Environmental Monitoring Plan For Airborne Radioactivity from Fugitive and Diffuse Sources, Oak Ridge, Tennessee", Oct 28, 1992.

[3]Memorandum with Attachment, Peter J. Gross to DOE site Managers and Directors, June 20, 1995, Attachment: "Memorandum of Understanding (MOU) Between the U.S. Environmental Protection Agency and the U.S. Department of Energy Concerning the Clean Air Act Emission Standards for Radionuclides 40 CFR Part 61 Including Subparts H, I, Q & T", April 5, 1995.

[4]The April 5, 1995 MOU between EPA and DOE was in draft form in 1992, which included an agreement to include data on fugitive and diffuse emissions as supplementary information in the annual air emissions report.

A description of the current ORR ambient air monitoring network and sampling and analysis procedures are given in the ORR Environmental Monitoring Plan (EMP)[5]. The ambient air monitoring network is reviewed on a regular basis and revisions are made as necessary to reflect physical or operational changes on the ORR. When appropriate, these reviews include air dispersion modeling to confirm that the locations of ambient air monitors as described in the ORR EMP adequately capture emissions from significant fugitive and diffuse sources currently in existence on the ORR. The ORR EMP is updated at a minimum once every three years or on an as needed basis and reflects program changes as they occur.

Ambient air monitoring results from the ORR show that radionuclide emissions from fugitive and diffuse sources, as an aggregate, do not produce off-site[6] atmospheric radionuclide concentrations that significantly contribute to reported radiation doses to the public. Historically, doses calculated using point source emissions and atmospheric dispersion models are often more than two times higher than those calculated using measured atmospheric radionuclide concentrations.

DOE-ORO uses ambient air monitoring to verify compliance with 40 CFR Part 61, Subpart H for fugitive and diffuse emission sources. EDE values calculated from environmental measurements are included in the ORR Annual Radionuclide Air Emissions Report, along with a site map of the locations of the ambient air monitors. Sampling and analytical procedures and quality assurance measures are consistent with the requirements of 40 CFR Part 61.93(b)(5) and are described in the ORR EMP.

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[5]U.S. Department of Energy, Oak Ridge Operations Office, Office of Environmental Management, “Environmental Monitoring Plan for the Oak Ridge Reservation, DOE/OR-1066/R4", July 2001.

[6]Federal Register Vol. 54, No. 240 (12/15/89) pg. 51665: "d. Definition of Facility. A problem in implementing the current standard is the ambiguity associated with the present definition of facility. To resolve this ambiguity, the new rule specifies that all the buildings, structures and operations within one contiguous site shall be considered a single facility. For example, the entire DOE facility at Oak Ridge, Tennessee must meet the current standard of 10 mrem/y EDE, instead of each individual building meeting the 10 mrem/y EDE standard."

ADDENDUM C.2 Monitoring for On-Site Receptors

The National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy (DOE) Facilities, 40 CFR Part 61, Subpart H, require that "emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any 'member of the public' to receive in any year an effective dose equivalent of 10 mrem/yr." A "member of the public" had been understood to be any ***offsite*** point [i.e., outside the Oak Ridge Reservation (ORR) boundary[1]] where there was a residence, school, business, or office. However, the management of DOE facilities has changed such that there are now non-DOE controlled activities within the ORR boundary or ***on-site***. In a February 2001 Environmental Protection Agency (EPA) guidance letter[2,3], EPA further defined "members of the public" as any entity on DOE property, whose employees do not wear DOE access security badges, and where there are no DOE security controls such as a fence that is locked and an established checkpoint (badge reader or guard) through which the employees must enter. EPA stated that such employees or entities must be considered "members of the public" in the Subpart H dose assessment. Also, in this guidance letter, EPA allowed the use of environmental measurements from ambient air monitors in lieu of continuous stack monitoring as an alternative method to demonstrate compliance with 40 CFR Part 61, Subpart H, for those on-site members of the public or dose receptors.

Along these same lines, on May 2, 2001, EPA Region IV approved the use of ambient air monitors as an alternative method to demonstrate compliance with the Subpart H standard as opposed to continuous stack monitoring of minor sources that would become major sources as a result of the presence of temporary on-site receptors at ORNL[4, 5, 6].
DOE uses ambient air monitors at key on-site receptor locations based on the maximum modeled potential dose to demonstrate compliance with the Subpart H standard, as approved in the above referenced guidance documents. The ambient air monitors are used in lieu of continuous stack monitoring of minor sources that would become major sources as a result of the presence of on-site receptors. The on-site receptors are included in the ORR Subpart H dose assessment reported to EPA in the ORR Radionuclide Air Emissions Report.

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[1]Federal Register Vol. 54, No. 240 (12/15/89) pg. 51665: "d. Definition of Facility. A problem in implementing the current standard is the ambiguity associated with the present definition of facility. To resolve this ambiguity, the new rule specifies that all the buildings, structures and operations within one contiguous site shall be considered a single facility. For example, the entire DOE facility at Oak Ridge, Tennessee must meet the current standard of 10 mrem/y EDE, instead of each individual building meeting the 10 mrem/y EDE standard."

[2]Memorandum, Frank Marcinowski to Regional Radionuclide NESHAPs Coordinators, "Criteria to Determine Whether a Leased Facility At DOE is Subject to Subpart H, " February 1, 2001.

[3]Letter, John Blevins (EPA IV) to Susan Cange (DOE-ORO), "Criteria to Determine Whether a Leased Facility at DOE is Subject to Subpart H", February 2, 2001.

[4]Letter, R. Douglas Neeley (EPA Region 4) to Joelle Key (TDEC), May 2, 2001.

[5]Letter, Joelle Key (TDEC) to Ed. Carreras, Chief (EPA Region 4), April 18, 2001.

[6]Letter, David L. Buhaly (DOE-ORO) to Joelle Key (TDEC), March 15, 2001, Attachment: "Request to Use an Alternative Method to Demonstrate Rad NESHAP Compliance in Support of Revitalization Activities at the U.S. Department of Energy Oak Ridge National Laboratory Facility".

For reporting the Effective Dose Equivalent (EDE) to the maximally exposed member of the public, air dispersion modeling from ORR radiological sources is performed for all receptors, ***on-site*** and ***offsite***. The EDE for all business receptors, both ***offsite*** and ***on-site***, is calculated using the same methodology as for the residential exposure scenario [i.e., assuming full occupancy (8,760 hours/year) and the "Rural" food source scenario in CAP-88], but then dividing the resulting dose in half. The resulting estimated business dose more accurately represents the time of exposure a single person would be exposed to airborne radionuclide emissions (4,380 hours/year), which is more than double the normal work year of 2,080 hours.

Measured ambient air monitoring concentrations are used to confirm that the dose to ***on-site*** members of the public is less than the 10 mrem/yr standard and demonstrates adequate protection to these members of the public from DOE radiological airborne emissions. If the measured dose from ambient air monitoring is higher than the calculated dose from air dispersion modeling of stack emissions, the measured dose will be reported as the dose to the maximally exposed member of the public. DOE will only perform continuous stack monitoring and apply for a Tennessee Air Pollution Control Regulation (TAPCR) permit to construct for minor sources that become major sources based on ***offsite*** receptors outside the ORR boundary.

EDE values calculated from the measured ambient air concentrations of radionuclides from each ambient air monitor located at key on-site receptors are reported in the appropriate calendar year ORR Annual Radionuclide Air Emissions Report along with a site map showing the locations of the ambient air monitors. Sampling and analytical procedures and quality assurance measures are consistent with the requirements of 40 CFR Part 61.93(b)(5) and are described in the ORR Environmental Monitoring Plan (EMP)[7].

[7]U.S. Department of Energy, Oak Ridge Operations Office, Office of Environmental Management, "Environmental Monitoring Plan for the Oak Ridge Reservation, DOE/OR-1066/R4", July 2001.

ADDENDUM C.3 ANSI/HPS N13.1-1999 Upgrade Policy

The final amendment to 40 Code of Federal Regulations (CFR) Part 61, Subpart H, promulgated September 9, 2002, requires the use of the American National Standards Institutes (ANSI)/Health Physics Society (HPS) N13.1-1999 standard[7] for "any newly constructed source and any source undergoing a modification that would result in an effective dose equivalent (EDE) to any member of the public greater than 1% of the standard." Emissions from existing point sources resulting in an EDE greater than 1% of the standard (i.e., an existing major source) can continue to be directly monitored following the guidance presented in ANSI N13.1-1969 "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities". In order to clarify when an existing source on the Oak Ridge Reservation undergoing a modification must be upgraded to meet the new design criteria of the ANSI/HPS N13.1-1999 standard, the following guidance will be followed:

1) Existing major sources that were modified under approval of the Tennessee Department of Environment and Conservation (TDEC) before the effective date of the Subpart H amendment (January 1, 2003) will still be "grandfathered" under the ANSI N13.1-1969 guidance, even though the radiological process or operations triggering the modifications begin after the effective date.

2) The determination as to whether or not to upgrade a radiological emission point source to the ANSI/HPS N13.1-1999 design criteria will be based on the EDE from **potential** emissions in accordance with 40 CFR 61.93(b)(4)(ii).

3) The changes to a facility must qualify as a modification under §61.15. Modifications or construction must occur on the source of emissions, not the sampling system.

4) Changes which meet the exemptions put forth in §61.15(d) will not ordinarily require a source sampling system to meet the ANSI/HPS N13.1-1999 design criteria. However, modifications to stacks, fans, emission control devices, and increases in production rate and hours of operation will be evaluated to determine if an increase in emissions results. If it is determined that an increase in emissions occurs, the increase will be further evaluated against the criteria in 5) and 6).

5) For existing major sources currently grandfathered under ANSI N13.1-1969,
   a) If the potential effective dose equivalent (PEDE) resulting from all emissions from a new or modified process exhausting through an existing major source is $\geq$ 0.1 mrem, then the existing major source sampling system must be upgraded to meet the new ANSI/HPS N13.1-1999 design criteria. Note that the emissions being evaluated are from the new or modified process, activity, or construction only.
   b) If the PEDE resulting from all emissions from a new or modified process exhausting through an existing major source is < 0.1 mrem, then the existing major source sampling system is sufficient.

6) For existing minor sources:
   a) If the total PEDE resulting from all emissions from a new or modified process and any existing radiological operations exhausting through an existing minor source is $\geq$ 0.1 mrem, then a new continuous emissions monitoring system must be installed in accordance with §61.93 (c-f) and must meet the new ANSI/HPS N13.1-1999 design criteria.
   b) If the total PEDE resulting from all emissions from a new or modified process and any existing

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7 "Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities," American National Standards Institutes (ANSI)/Health Physics Society (HPS) N13.1-1999.

radiological operations exhausting through an existing minor source is < 0.1 mrem, continuous monitoring of the source is not required.

7) Environmental Protection Agency (EPA)/TDEC Notification
   a) Determinations to notify TDEC for approval to construct or modify a source will be based on the EDE from **actual** emissions in accordance with 40 CFR 61.96.
   b) If the change is not considered a modification under §61.15, then no EPA/TDEC notification is required.
   c) If the change is a modification, but does not result in an increase in actual emissions causing an EDE of 0.1 mrem to an off-site receptor, then EPA and TDEC will be notified via the U.S. Department of Energy Air Emissions Annual Report for the Oak Ridge Reservation in June of the year following the applicable calendar year of operations.
      i) NOTE: Increase in emissions is a net 0.1 mrem increase for existing major sources grandfathered under ANSI N13.1-1969.
   d) If the change is a modification, and does result in an increase in actual emissions causing an EDE of 0.1 mrem or greater to an off-site receptor, then TDEC pre-construction notification & approval is required.

JUSTIFICATION FOR USING 40 CFR PART 61, APPENDIX D EMISSION FACTORS FOR RADIOACTIVE AND NONRADIOACTIVE MATERIAL

Applicability to the Y-12 Complex for both Radioactive and Nonradioactive Materials

The Environmental Protection Agency (EPA) has promulgated National Emission Standards for Hazardous Air Pollutants (NESHAP) for DOE, Nuclear Regulatory Commission-licensed (NRC) and non-DOE Federal facilities. These standards are found in 40 CFR Part 61, Subparts H and I. Appendix D of Part 61 defines a very conservative method of estimating emissions from radionuclide processes. Appendix D methods may also be used for existing sources when no other, more accurate methods are available (such as AP-42 emission factors) or feasible (such as costly emission testing of minor emission sources). The use of Appendix D is consistent with the provisions of Section 6a of the EPA/DOE Memorandum of Understanding (MOU).

The Y-12 Complex processes both radioactive and nonradioactive materials such as uranium, lithium, steel, iron, brass, and copper. Such materials are used and/or processed in different forms in accordance with the process. Since Appendix D methods of 40 CFR 61 are used to estimate emission of radioactive material during processing, the Y-12 Complex also uses the Appendix D methods (emission factors) for estimating emissions of **nonradioactive material during processing**. In cases where no other accurate emission estimation methods are available, the Y-12 Complex utilizes the emission estimation methodology of Appendix D. The Y-12 Complex will use the most conservative and applicable emission factors for the material used during operation. Each process will be reviewed throughly by the operations personnel and Environmental Compliance Department (ECD) Engineers.

Appendix D of 40 CFR 61 assumes that any radioactive material heated above 100 degrees Celsius is completely vaporized and emitted to the atmosphere (i.e., emission factor = 1.0). For example, this is an overly conservative assumption for elemental uranium since the melting and boiling points are 1132 and 3818 degrees Celsius, respectively. An agreement between the EPA and DOE states that, for example (1) an emission factor of 1 shall be applied to elemental uranium heated to temperatures greater than 3000 degrees Celsius to compensate for the extremely high melting and boiling points; (2) an emission factor of 10^{-3} may be applied to elemental uranium heated above 1100 degrees Celsius but less than 3000 degrees Celsius; (3) an emission factor of 10^{-6} may be applied to elemental uranium heated below 1100 degrees Celsius provided the uranium is in solid form; and (4) the exclusion for sealed radionuclides cannot be extended to radionuclides in solid form, since the Appendix D method explicitly requires an emission factor of 10^{-6} for radionuclides in solid form. Moreover, the Y-12 Complex personnel will apply the same Appendix D emission factors methodology when processing nonradioactive materials. Since the emission factors used for radioactive materials are conservative, the ECD personnel assume that the Appendix D emission factors could be used also for nonradioactive materials when there is no other method available. Nonradioactive materials would be less harmful to the public than radioactive materials.

Background Information on Approval of Emission Factors

From an extensive search for data suitable for deriving emission factors, the EPA has developed a Background Information Document (BID) that deals only with the compliance procedures for implementing the radionuclide NESHAP covering NRC-licensed and non-DOE Federal facilities (40 CFR Part 61, Subpart I). The BID provides (1) the basis for the calculation and analytical methods approved for determining emissions and (2) the basis for the procedures approved for demonstrating compliance with the dose limits of the standard. The compliance procedures include methods for determining the quantities of radionuclides released to the atmosphere and methods for estimating the resulting doses to the most exposed individual.

The facilities covered by the NESHAP and the activities at these facilities involving the use of radioactive materials are quite diverse. They include both NRC material licensees and facilities engaged in the uranium fuel cycle. NRC material licensees include radiopharmaceutical suppliers and medical users, government, academic and private research facilities, test and research reactors, low-level waste shippers and disposal sites, and other suppliers and users of radionuclides.

The NESHAP limits annual radionuclide emissions to the atmosphere from these facilities to such quantities that will not result in any member of the public receiving an effective dose equivalent in excess of 10 millirem per year (mrem/yr). Facilities covered by the NESHAP are subject to the reporting and approval requirement of 40 CFR Part 61, Subpart I. The approval requirements are waived if the emissions from a newly constructed or modified facility will not cause any member of the public to receive a dose in excess of one (1) percent of the standard.

Dose is a complicated function of the quantity of each radionuclide emitted; the physical configuration of the facility releasing the material; the dispersion, transport, and build-up of the radionuclides in the soil and foodstuffs; and the proximity of the facility to individuals and farms producing foodstuffs. The doses resulting from the release of radionuclides to the atmosphere can be determined by environmental monitoring; valid measurements are often impossible to obtain.

Therefore, compliance with the limit of the standard is to be demonstrated using EPA-approved methods of determining emissions and EPA-approved procedures for estimating the resulting doses. The NESHAP includes approved calculation and analytical methods for determining emissions, and a number of alternative procedures for determining doses. Other methods and procedures (including those based on environmental measurements) must be submitted to the EPA for approval before they are used.

Determination of Emissions

Assessment of the doses resulting from the release of radioactive materials into the air begins with a determination of the source term. Since dose is partly a function of the chemical and physical forms of the radionuclides in the effluent, a fully defined source term includes the emission rate and the physical characteristics of each chemical species in the effluent. In order to demonstrate compliance with the standard, the source term needs to be determined.

Emissions may be calculated based on monitoring data obtained using EPA-approved sampling and analytical methods. Since many of the facilities covered by the NESHAP do not have monitoring data on the quantities of radionuclides released to the atmosphere, the EPA has derived airborne emission factors and effluent control adjustment factors applicable to the facilities covered by the NESHAP. An airborne emission factor is defined as the quantity of the material released to the air per unit time divided by the quantity of the material handled in an unsealed form over the same period of time (emission factors as the pre-effluent control fraction of a radioactive material that becomes airborne). The quantity of material that is released to the atmosphere is the product of the quantity that becomes airborne and the appropriate effluent control adjustment factor. The approved emission factors and effluent control adjustment factors are considered by EPA to conservatively estimate emissions or radionuclide materials based on the type of materials used and the manner in which the material is processed. Therefore, these emission factors were derived from EPA study and review of various types of facilities and activities involving the use of radioactive materials. The facilities and activities include NRC material licensees and facilities engaged in the uranium fuel cycle, radiopharmaceutical suppliers and medical users, government, academic and private research facilities, test and research reactors, low-level waste shippers and disposal sites, and other suppliers and users of radionuclides.

Therefore, the NESHAP BID gives further details of the approved calculation and analytical methods for determining emissions and a number of alternative procedures for determining doses by the EPA. Since many of the facilities covered by the NESHAP do not have monitoring data on the quantities of radionuclides released to the atmosphere, the EPA has derived **airborne emission factors** and **effluent control adjustment factors** applicable to the facilities covered by the NESHAP. Again, the fraction of material released to the atmosphere depends on the physical and chemical form of the radionuclide and the handling that the material undergoes. The approved emission factors apply to **uncontrolled releases**. Thus, when controls are used, credit can be taken for the control efficiency by the effluent control adjustment factors.

The EPA conducted an extensive search for data suitable for deriving emission factors. Such data include reported release fractions, measured emissions, measured air concentrations, and measured intakes of radionuclides by workers. The approved emission factors were developed separately for gases, liquids and powders, and solids and capsules. The emission factors for the physical state of the radionuclides are briefly discussed below.

Gases

The EPA has collected data of radionuclides used in gaseous form at the facilities subject to the NESHAP which include argon, carbon-14, krypton, tritium, and xenon. Additional radionuclides such as sulfur, bromine, and uranium may also exist in gaseous forms. The approved emission factor for all radionuclides in gaseous form is **one (1)**. It is recognized that this emission factor will overestimate the actual emissions in many cases. Based on the intrinsic properties of gases, the manner in which they are used in medical and research applications, and the limited amount of data available, an emission factor of 1.0 for gases has been selected. Any material with a boiling point of 100 degrees C or less shall be considered a gas for the purpose of determining

the appropriate emission factor.

Liquids and Powders

Almost all of the radionuclides used by the facilities (ones reviewed/researched by the EPA) subject to the NESHAP can be obtained in the form of liquids or powders. Radionuclides used for medical purposes are almost always in the liquid form for ease of administration. Similarly, radionuclides used in research are most frequently in the form of liquids or powders to facilitate handling. Facilities that manufacture radiopharmaceuticals handle materials in liquid form, as do the facilities that produce self-illuminating watches and other products using tritiated paints. More than 250 measured data points were used and/or researched to derive an emission factor for liquids and powders. The measured data points reflect such diverse activities as radiopharmaceutical dose preparation, patient dose preparation and administration, beneficiation of powdered ore concentrates, chemical processing and conversion, routine research activities, and laboratory accidents. Because of the similarity in the magnitudes of the emission factors derived in the BID for both liquids and powders, a single emission factor of $\mathbf{10^{-3}}$ is approved for both forms. This value is roughly equivalent to the maximum emission factor derived for either liquids or powders.

The EPA has determined that any material, whether the process involves liquids, powders or solids, with a boiling point of 100 degrees C or less shall be considered to be a gas for the purpose of determining emissions. The EPA has assigned a conservative emission factor of 1 to all radionuclides that are heated to temperatures of 100 degrees C or higher. The EPA wants to be certain that there is almost no probability that the approved emission factors for liquids or powders will be exceeded in practice.

Solids

Relatively few of the facilities (ones reviewed/researched by the EPA) covered by the NESHAP use radioactive materials in solid or capsule forms. The most prevalent use of solid materials is in the manufacture of sealed radiation sources. If a liquid or powder is contained in a sealed capsule and is not exposed to a temperature exceeding 100 degrees C, it may be considered to be a solid. The approved emission factor for solids and capsules is $\mathbf{10^{-6}}$. It is valid for all radionuclide/handling processing combinations except those involving volatile solids or solids subjected to elevated temperatures. For solids with a boiling point of 100 degrees C or less, the material shall be considered a gas, and an emission factor of 1 shall be used. For solid materials subjected to high-temperature processing (100 degrees C or higher), an emission factor of 1 shall be used.

Appendix D - Example Calculation of Radionuclide Emissions

Radionuclide emissions to the atmosphere may be estimated from dose calculations instead of measuring emissions in accordance with 40 CFR 61 Appendix D Methods. In order to estimate emissions to the atmosphere: (1) determine the amount (in curies) used at the facility for the period under consideration, (2) multiply the amount used by the Appendix D emission factors, which depend on the physical state of the radionuclide, and (3) if a control device is installed

between the place of use and the point of release, it can be multiplied by the EPA's approved adjustment factor given in Table 1 of Appendix D.

A compliance plan, ES/ESH-45, was developed by the Y-12 Complex personnel to show the method of estimating a potential dose from each emission point. The following formula is used:

$$\text{Potential Dose (mrem/yr)} = \frac{\text{Dose (mrem)}}{\text{Source Term (Ci)}} \times [\text{Potential Source Term (Ci)}],$$

Where dose (mrem)/source term (Ci) is the maximum value from the ORR for the past three years. The potential source term (in curies) is calculated without any consideration of abatement equipment. If the estimated potential dose calculated with the above formula is greater than 0.05 mrem/yr, the EPA-approved CAP-88 model is used to verify the potential dose.

Example:

1. Material - Uranium (U)
2. Amount of U emitted from stack sampler = 35 g/yr
3. The highest effective dose equivalent to curie ratio for uranium from the ORR is 35.33 mrem/C_i for the past three years
4. The conversion factor for depleted uranium is 5.32×10^{-7} C_i/g

Potential Dose of Uranium (mrem/yr)

$$\frac{35\text{ g}}{\text{yr}} \left| \frac{5.32 \times 10^{-7} C_i}{\text{g}} \right| \frac{35.33\text{ mrem}}{C_i} \Bigg| = \mathbf{6.6 \times 10^{-4}\ mrem\ U/yr}$$

When there is no stack sampler used for a process, emissions can be calculated as follows:

Example:

1. Material - Uranium
2. Maximum Input to Process = 100 lb/hr (assuming all used is emitted)
3. The highest effective dose equivalent to curie ratio for uranium from the ORR is 35.33 mrem/C_i for the past three years
4. The conversion factor for depleted uranium is 5.32×10^{-7} C_i/g.
5. No control device efficiency was used to calculate the potential dose.

Potential Dose of Uranium (mrem/yr)

$$\frac{100\ lb}{hr}\left|\frac{8{,}760\ hr}{yr}\right|\frac{454\ g}{lb}\left|\frac{5.32 \times 10^{-7} C_i}{g}\right|\frac{35.33\ mrem}{C_i}\left|\frac{10^{-6}}{}\right| = \mathbf{7.5 \times 10^{-3}\ mrem\ U/yr}$$

Since the maximum/potential dose of uranium emitted is below the regulatory limit of 0.1 mrem/yr, in accordance with 40 CFR 61.93 and 61.96 and TDEC Rule 1200-3-11-.08, continuous sampling, analysis, and EPA NESHAP approvals are not required. Therefore, this emission source is exempt from air permitting requirements.

Example Calculation of Estimating Nonradioactive Emissions using Appendix D Methods

In cases where no other accurate emission estimation methods are available, the Y-12 Complex staff also utilizes the emission estimation methodology of Appendix D for nonradioactive materials.

Example:

1. Material - Stainless Steel
2. Maximum Input to Process = 120 lb/hr (assuming all is emitted)
3. Physical State = Solid
4. Appendix D Emission Factor for Solids = 10^{-6}
5. Control Device = HEPA Filter
6. The control device is not required by a standard and is not used in calculations to determine fees or used to demonstrate compliance.

Maximum Allowable Particulate Emissions

$$\frac{120\ lb}{hr}\left|\frac{8{,}760\ hr}{yr}\right|\frac{ton}{2{,}000\ lb}\left|\frac{10^{-6}}{}\right| = \mathbf{5.26 \times 10^{-4}\ ton\ part/yr}$$

Since Appendix D methods of 40 CFR 61 are used to estimate emission of radioactive material during processing, the Y-12 Complex also uses the Appendix D methods (emission factors) for estimating emission on **nonradioactive material during processing** in cases where no other accurate emission estimation methods are available. The Y-12 Complex will use the most conservative and applicable emission factors for the material used during operation.

Inherent Limitation on the Potential to Emit for Y-12 Complex Emission Units

The primary production activity conducted at the Y-12 Complex is the manufacture and recovery of nuclear weapons components for national defense. Major activities include chemical processing of nuclear materials; metallurgical operations such as alloy melting, casting, rolling, forming; and machining of finished piece parts. A number of support activities, such as welding, cutting, heat-treating, equipment maintenance, and other activities, are also performed to support the primary production operations.

Because much of the equipment at the Y-12 Complex is commercially manufactured production equipment, the designed maximum potential to emit is significant. However, because of the nature of the products being produced at the Y-12 Complex, the actual potential to emit is inherently limited by the overall production load at the complex. For this reason, the material inputs to production-related emission units have been established based on maximum Y-12 production loads which were experienced in the past, rather than on the theoretical potential processing rate. Currently, the actual processing rate is only a small fraction of the historic maximum rate due to reduced production loads in the post-Cold War era. Much of the actual input data for the production units at the Y-12 National Security Complex is controlled information under the Atomic Energy Act of 1954 and under Executive Order 12356. Use of maximum Y-12 production loads, which are extremely conservative, on permit application forms serves to bound material inputs for air permitting purposes while maximizing the amount of information that can be disclosed and still remain in compliance with the Act and Order. Further, it should be noted that there are a number of insignificant activities at the complex which are also inherently limited by the overall production load.