Z-AREA SALTSTONE DISPOSAL FACILITY GROUNDWATER MONITORING REPORT (U)

FIRST AND SECOND QUARTERS 1996

Publication Date: July 1996

Authorized Derivative Classifier
and Reviewing Official:

UNCLASSIFIED
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Controlled Nuclear Information

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

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Prepared for the U.S. Department of Energy under Control Contract No. DE-AC09-89SR18035

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Key Words

**Industrial Waste Permit IWP-217
low-level radioactive waste
ZBG wells**

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First and Second Quarters 1996 Data Review

Key to Reading the Tables

The following abbreviations may appear in the data tables:

Constituents

1,2,3,4,6,7,8-HPCDD	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-HPCDF	1,2,3,4,6,7,8-heptachlorodibenzo-p-furan
1,2,3,4,7,8-HXCDD	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,4,7,8-HXCDF	1,2,3,4,7,8-hexachlorodibenzo-p-furan
Lindane	gamma-benzene hexachloride
PCB	polychlorinated biphenyl
1,2,3,7,8-PCDD	1,2,3,7,8-pentachlorodibenzo-p-dioxin
1,2,3,7,8-PCDF	1,2,3,7,8-pentachlorodibenzo-p-furan
Sp. conductance	specific conductance
TCDD	tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzo-p-furan

Laboratories

CN	Clemson Technical Center, Inc.
EM	Environmental Protection Department/Environmental Monitoring Section (EPD/EMS) Laboratory
GE and GP	General Engineering Laboratories, Inc.
SC	Savannah River Technology Center
SP	Spencer Testing Services, Inc.
TM	TMA/Eberline
WA and WS	Roy F. Weston, Inc.

Sampling Codes

B	blank sample was collected
C	well was pumping continuously
D	well was dry
E	equipment blank was collected
I	well went dry during sampling; insufficient water to collect all samples
L	well went dry before sampling began; only depth to water can be determined
N	well was not stabilized before sampling began
P	inaccessibility or mechanical failure prevented sample collection and field analysis of the water
S	no water in standpipe; for water-level events only

W	purged water must be containerized; only water-level measurements were obtained
X	well went dry during purging; samples collected after well recovered

Sampling Methods

B	sample collected using an open-bucket bailer
P	sample collected using a bladder pump
S	sample collected using a single-speed centrifugal downhole pump
V	sample collected using a variable-speed pump

Units

mg/L	milligrams per liter
msl	mean sea level
MSL	million structures per liter
NTU	nephelometric turbidity unit
pCi/L	picocuries per liter
pCi/mL	picocuries per milliliter
pH	pH unit
µg/L	micrograms per liter
µS/cm	microsiemens per centimeter

Other

CS	carbon steel
DF	dilution factor column in data tables
E	exponential notation (e.g., $1.1\text{E}-09 = 1.1 \times 10^{-9} = 0.0000000011$)
H	holding time column in data tables
Mod	modifier column in data tables
PDWS	primary drinking water standard
PVC	polyvinyl chloride
ST	exceeded the final PDWS or screening level column in data tables
TOC	Top of casing

Holding Times

Standard analytical methods include a limit, called holding time, on the maximum elapsed time between sample collection and extraction or analysis by the laboratory. In the data tables, a large bullet (•) in the *H* (holding time) column indicates that holding time was exceeded. Analyses performed beyond holding times may not yield valid results.

The South Carolina Department of Health and Environmental Control (SCDHEC) allows only 15 minutes to elapse between sampling and analysis for pH. Thus, only field pH measurements can meet the holding time criterion; laboratory pH analyses always will exceed it.

The laboratory procedure used for the determination of specific conductance allows one day to elapse between sampling and analysis. Thus, laboratory specific conductance measurements may exceed the holding time criterion.

Data Rounding

Constituent results in analytical results tables that appear to equal the final PDWS but are not marked in the *ST* (exceeded the final PDWS or screening level) column are below the final PDWS in the database. Values stored in the database contain more significant digits than the reported results. Apparent discrepancies in the tables are due to the rounding of reported results.

Data Qualification

The contract laboratories submit sample- or batch-specific quality assurance/quality control information either at the same time as analytical results or in a quarterly summary. Properly defined and used data modifiers (also referred to as qualifiers) can be a key component in assessing data usability. Modifiers designed by EPD/EMS and provided to the primary laboratories are defined below. These modifiers appear in the data tables under the column *Mod*. The lettered modifiers are based on EPA's STORET codes.

Modifiers

(Blank)	Data are not qualified. Numbers should be interpreted exactly as reported.
I	The value in the result field is the instrument reading, not the sample quantitation limit. Always used with the result qualifier <i>U</i> .
J	Value is estimated because quantitation in the sample or in associated quality control samples did not meet specifications.
L	Value is off-scale high. The actual value is not known but is known to be greater than the value shown.
M	Presence of the analyte is verified but not quantified.
R	Result was rejected because performance requirements in the sample analysis or associated quality control analyses were not met.
T	Analyte was not detected; if present, it was below the criteria for detection.
U	Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.
V	Analyte was detected in an associated method blank.
Y	Result was obtained from an unpreserved or improperly preserved sample. Data may not be accurate.
1	Result may be an underestimation of the true value due to analytical bias.
2	Result may be an overestimation of the true value due to analytical bias.
3	The associated result may be of poor precision (high variability) due to analytical bias.

Note: These are only some of the qualifiers present in the database. All modifiers associated with the data are published in the result tables of EPD/EMS' quarterly groundwater monitoring reports, the official repository of the data.

Table 1. Groundwater Monitoring Results for Individual Wells

WELL ZBG 1

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Screen Zone
N76584.2 E65584.1	33.302161 °N 81.642863 °W	240.1-220.0 ft msl	291.1 ft msl	4" PVC	S	Water Table

SAMPLE DATE 02/21/96 05/01/96

FIELD DATA

Parameter	1Q96	2Q96	Unit
Water elevation	234.5	234.1	ft msl
pH	5.4	5.2	pH
Sp. conductance	22	26	µS/cm
Water temperature	21.0	23.0	°C
Alkalinity as CaCO ₃	2	1	mg/L
Turbidity	1	1	NTU
Volume purged	15	14	well vol
Sampling code			

ANALYTICAL DATA

Parameter	1Q96	DF	Mod	ST	H	Flag	Lab	2Q96	DF	Mod	ST	H	Flag	Lab	Unit
Actinium-228	3.0E+00	1	UI			0	GP	1.5E+00	1	UI			0	TM	pCi/L
Aluminum, total recoverable	<35	1	V			0	GE								µg/L
Antimony, total recoverable	<2.7	1	V			0	GE	2.8	1	J3			0	WA	µg/L
Antimony-124	1.4E-01	1	UI			0	GP	2.8E-01	1	UI			0	GP	pCi/L
Antimony-125	-2.4E+00	1	UI			0	GP	5.8E+00	1	J1			0	TM	pCi/L
Arsenic, total recoverable	<5.6	1	V			0	GE	<5.0	1				0	GE	µg/L
Barium, total recoverable	18	1	V			0	GE	21	1				0	WA	µg/L
Barium-133	7.0E-01	1	UI			0	GP	1.0E-02	1	UI			0	TM	pCi/L
Benzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Boron, total recoverable	<50	1				0	GE								µg/L
Bromodichloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Bromoform	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Bromomethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Cadmium, total recoverable	0.20	1	J			0	GE	<2.0	1				0	GE	µg/L
Carbon tetrachloride	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Cerium-144	3.7E+00	1	UI			0	GP	-3.5E-01	1	UI			0	GP	pCi/L
Cesium-134	-5.4E-01	1	UI			0	GP	3.4E-01	1	UI			0	GP	pCi/L
Cesium-137	-3.6E-01	1	UI			0	GP	-1.2E-02	1	UI			0	GP	pCi/L
Chlorobenzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloroethene (Vinyl chloride)	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
2-Chloroethyl vinyl ether	<10	1				0	GE	<10	1				0	GE	µg/L
Chloroform	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chromium, total recoverable	0.86	1	J			0	GE	<1.7	1	V			0	WA	µg/L
Cobalt-57	3.3E-01	1	UI			0	GP	3.2E-01	1	UI			0	TM	pCi/L
Cobalt-58	4.2E-01	1	UI			0	GP	4.0E-02	1	UI			0	TM	pCi/L
Cobalt-60	-2.2E-01	1	UI			0	GP	-2.6E-01	1	UI			0	TM	pCi/L
Dibromochloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1-Dichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,2-Dichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1-Dichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,2-Dichloroethylene	<2.0	1				0	GE	<5.0	1				0	WA	µg/L
trans-1,2-Dichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Dichloromethane	<10	1				0	GE	<1.4	1	JV			0	GE	µg/L
1,2-Dichloropropane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
cis-1,3-Dichloropropene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
trans-1,3-Dichloropropene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Ethylbenzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Europium-152	-1.6E+00	1	UI			0	GP	-2.0E-02	1	UI			0	TM	pCi/L
Europium-154	-1.6E+00	1	UI			0	GP	-4.4E-01	1	UI			0	TM	pCi/L
Europium-155	1.7E+00	1	UI			0	GP	-7.3E-01	1	UI			0	TM	pCi/L
Gross alpha	1.6E+00	1	J			0	GP	1.9E+00	1				0	TM	pCi/L
Iodine-129								1.0E+02	1				2	TM	pCi/L
Lead, total recoverable	9.6	1	V			0	GE	10	1	J			0	WA	µg/L
Lead-212	3.7E+00	1				0	GP	2.0E-02	1	UI			0	TM	pCi/L
Lithium, total recoverable	<25	1				0	GE								µg/L

● = exceeded holding time.

■ = exceeded screening level, final PDWS, or SCDHEC-proposed groundwater monitoring standard.

WELL ZBG 1 (cont.)

Parameter	1Q96	DF	Mod	ST	H	Flag	Lab	2Q96	DF	Mod	ST	H	Flag	Lab	Unit
Manganese-54	-4.3E-01	1	UI			0	GP	7.5E-02	1	UI			0	GP	pCi/L
Mercury, total recoverable	<0.031	1	V			0	GE	<0.048	1	JV			0	GE	µg/L
Neptunium-239	2.3E+00	1	UI			0	GP	5.4E+00	1	UI			0	GP	pCi/L
Nitrate-nitrite as nitrogen	1,600	1	V			0	GE	1,300	2				0	WA	µg/L
Nitrite as nitrogen	<5.0	1	J1		●	0	GE	<5.0	1				0	GE	µg/L
Nonvolatile beta								1.2E+00	1	J3			0	GP	pCi/L
Potassium-40	2.2E+01	1	UI			0	GP	3.5E-01	1	UI			0	TM	pCi/L
Promethium-144	7.6E-01	1	UI			0	GP	3.0E+00	1	J1			0	TM	pCi/L
Promethium-146	4.0E-01	1	UI			0	GP	5.8E+00	1	J1			0	TM	pCi/L
Radium, total alpha-emitting	5.0E-01	1	UIV			0	GP	6.1E-01	1				0	TM	pCi/L
Ruthenium-106	-3.3E+00	1	UI			0	GP	-3.2E+00	1	UI			0	GP	pCi/L
Selenium, total recoverable	<5.0	1				0	GE	<5.0	1				0	GE	µg/L
Silver, total recoverable	<2.0	1	J			0	GE	<2.0	1				0	GE	µg/L
Sodium-22	-5.6E-01	1	UI			0	GP	2.9E-01	1	UI			0	TM	pCi/L
Technetium-99	-7.4E+00	1	UI			0	GP	3.0E-01	1	UI			0	TM	pCi/L
1,1,2,2-Tetrachloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Tetrachloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Thorium-234	0.0E+00	1	UI			0	GP								pCi/L
Tin-113	-4.0E-01	1	UI			0	GP	1.2E+00	1	UI			0	TM	pCi/L
Toluene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1,1-Trichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1,2-Trichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Trichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Trichlorofluoromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Tritium	9.3E+00	1				0	GP	9.0E+00	1				0	GP	pCi/mL
Xylenes								<5.0	1				0	WA	µg/L
Yttrium-88	-5.5E-01	1	UI			0	GP	-2.8E-01	1	UI			0	TM	pCi/L
Zinc-65	1.7E+00	1	UI			0	GP	-2.0E-01	1	UI			0	TM	pCi/L
Zirconium-95	-2.3E+00	1	UI			0	GP	-1.0E-02	1	UI			0	TM	pCi/L

WELL ZBG 1A

SRS Coord.	Lat/Longitude	Screen Zone Elevation	Top of Casing	Casing	Pump	Screen Zone
N76588.5 E65598.8	33.302195 °N 81.642833 °W	281.0-276.0 ft msl	291 ft msl	4" PVC	B	Perched Zone
SAMPLE DATE	02/21/96		05/01/96			
FIELD DATA						
Parameter	1Q96		2Q96			Unit
Water elevation	276.0					ft msl
pH						
Sp. conductance						
Water temperature						
Alkalinity as CaCO ₃						
Turbidity						
Volume purged						
Sampling code	D		D			

● = exceeded holding time.

■ = exceeded screening level, final PDWS, or SCDHEC-proposed groundwater monitoring standard.

WELL ZBG 2

<u>SRS Coord.</u>	<u>Lat/Longitude</u>	<u>Screen Zone Elevation</u>	<u>Top of Casing</u>	<u>Casing</u>	<u>Pump</u>	<u>Screen Zone</u>
N76170.5 E67472.9	33.304327 °N 81.637084 °W	230.9-210.9 ft msl	278 ft msl	4" PVC	S	Water Table

SAMPLE DATE 02/22/96 05/01/96

FIELD DATA

<u>Parameter</u>	<u>1Q96</u>	<u>2Q96</u>	<u>Unit</u>
Water elevation	220.9	223.2	ft msl
pH	4.9	4.8	pH
Sp. conductance	22	19	µS/cm
Water temperature	21.0	23.0	°C
Alkalinity as CaCO ₃	1	2	mg/L
Turbidity	1	1	NTU
Volume purged	9.8	6.9	well vol
Sampling code			

ANALYTICAL DATA

<u>Parameter</u>	<u>1Q96</u>	<u>DF</u>	<u>Mod</u>	<u>ST</u>	<u>H</u>	<u>Flag</u>	<u>Lab</u>	<u>2Q96</u>	<u>DF</u>	<u>Mod</u>	<u>ST</u>	<u>H</u>	<u>Flag</u>	<u>Lab</u>	<u>Unit</u>
Acetone								<10	1				0	GE	µg/L
Actinium-228	1.6E-01	1	UI			0	TM	3.9E+00	1	UI			0	GP	pCi/L
Aluminum, total recoverable	16	1	J			0	WA								µg/L
Antimony, total recoverable	<5.0	1				0	GE	<5.0	1				0	GE	µg/L
Antimony-124	-3.6E-01	1	UI			0	TM	1.7E+00	1	UI			0	GP	pCi/L
Antimony-125	-4.9E-01	1	UI			0	TM	2.7E+00	1	UI			0	GP	pCi/L
Arsenic, total recoverable	<5.0	1				0	GE	2.8	1	J			0	GE	µg/L
Barium, total recoverable	6.8	1				0	WA	7.1	1	V			0	GE	µg/L
Barium-133	1.1E+00	1	UI			0	GP	1.1E+00	1	UI			0	GP	pCi/L
Benzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Boron, total recoverable	<50	1				0	GE								µg/L
Bromodichloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Bromoform	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Bromomethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Cadmium, total recoverable	<2.0	1				0	GE	0.17	1	J			0	GE	µg/L
Carbon disulfide								<5.0	1				0	GE	µg/L
Carbon tetrachloride	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Cerium-144	-1.6E+00	1	UI			0	TM	8.3E+00	1	UI			0	GP	pCi/L
Cesium-134	4.5E-01	1	UI			0	TM	2.9E-01	1	UI			0	GP	pCi/L
Cesium-137	-1.4E-01	1	UI			0	TM	-1.7E-03	1	UI			0	GP	pCi/L
Chlorobenzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloroethene (Vinyl chloride)	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
2-Chloroethyl vinyl ether	<10	1				0	GE	<10	1				0	GE	µg/L
Chloroform	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Chromium, total recoverable	0.93	1	J			0	GE	0.95	1	J			0	GE	µg/L
Cobalt-57	1.0E-02	1	UI			0	TM	1.5E+00	1	UI			0	GP	pCi/L
Cobalt-58	-1.3E-01	1	UI			0	GP	6.5E-01	1	UI			0	GP	pCi/L
Cobalt-60	-9.0E-02	1	UI			0	TM	-3.3E-01	1	UI			0	GP	pCi/L
Dibromochloromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1-Dichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,2-Dichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1-Dichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,2-Dichloroethylene	<5.0	1				0	WA	<2.0	1				0	GE	µg/L
trans-1,2-Dichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Dichloromethane	2.5	1	J			1	WA	<1.9	1	V			0	GE	µg/L
1,2-Dichloropropane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
cis-1,3-Dichloropropene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
trans-1,3-Dichloropropene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Ethylbenzene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Europium-152	-3.6E-01	1	UI			0	TM	3.2E+00	1	UI			0	GP	pCi/L
Europium-154	1.0E+00	1	UI			0	TM	1.2E+00	1	UI			0	GP	pCi/L
Europium-155	4.7E-02	1	UI			0	GP	6.8E+00	1	UI			0	GP	pCi/L
Gross alpha	2.5E+00	1	J			0	GP	4.6E-01	1				0	GP	pCi/L
2-Hexanone								<10	1				0	GE	µg/L
Iodine-129	-1.1E+01	1	UI			0	TM								pCi/L
Lead, total recoverable	<5.0	1				0	GE	<3.6	1	JV			0	GE	µg/L
Lead-212	8.9E+00	1				0	GP	2.4E+00	1	UI			0	GP	pCi/L

● = exceeded holding time.

■ = exceeded screening level, final PDWS, or SCDHEC-proposed groundwater monitoring standard.

WELL ZBG 2 (cont.)

Parameter	1Q96	DF	Mod	ST	H	Flag	Lab	2Q96	DF	Mod	ST	H	Flag	Lab	Unit
Lithium, total recoverable	<0.44	1	V			0	WA								µg/L
Manganese, total recoverable	4.5	1				0	GE								µg/L
Manganese-54	0.0E+00	1	UI			0	TM	-1.2E+00	1	UI			0	GP	pCi/L
Mercury, total recoverable	<0.046	1	V			0	GE	<0.11	1	JV			0	GE	µg/L
Methyl ethyl ketone								<5.0	1				0	GE	µg/L
Methyl isobutyl ketone								<10	1				0	GE	µg/L
Neptunium-239	-2.9E+00	1	UI			0	GP	3.7E+00	1	UI			0	GP	pCi/L
Nickel, total recoverable	1.5	1	J			0	GE								µg/L
Nitrate-nitrite as nitrogen	900	1	V			0	GE	800	1	V			0	GE	µg/L
Nitrite as nitrogen	<5.0	1	J1		●	0	GE	<5.0	1				0	GE	µg/L
Potassium-40	1.0E+00	1	UI			0	TM	1.5E+01	1	UI			0	GP	pCi/L
Promethium-144	-1.9E-01	1	UI			0	TM	2.8E-01	1	UI			0	GP	pCi/L
Promethium-146	-4.4E-01	1	UI			0	TM	1.3E+00	1	UI			0	GP	pCi/L
Radium, total alpha-emitting	1.0E-01	1	UI			0	GP	-1.0E-01	1	UJI			0	GP	pCi/L
Ruthenium-106	1.1E-02	1	UI			0	GP	1.3E+01	1	UI			0	GP	pCi/L
Selenium, total recoverable	<5.0	1				0	GE	<5.0	1				0	GE	µg/L
Silver, total recoverable	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Sodium-22	3.6E-01	1	UI			0	TM	4.5E-01	1	UI			0	GP	pCi/L
Styrene								<2.0	1				0	GE	µg/L
Technetium-99	2.0E+01	1	J1			0	TM	-1.9E+01	1	UI			0	GP	pCi/L
1,1,2,2-Tetrachloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Tetrachloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Thorium-234	1.5E+01	1	UI			0	TM								pCi/L
Tin-113	8.7E-01	1	UI			0	TM	-1.2E+00	1	UI			0	GP	pCi/L
Toluene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1,1-Trichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
1,1,2-Trichloroethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Trichloroethylene	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Trichlorofluoromethane	<2.0	1				0	GE	<2.0	1				0	GE	µg/L
Tritium	8.5E+00	1				0	GP	8.4E+00	1				0	GP	pCi/mL
Vinyl acetate								<10	1				0	GE	µg/L
Xylenes	<5.0	1				0	WA	<2.0	1				0	GE	µg/L
Yttrium-88	-2.8E-01	1	UI			0	GP	-1.5E+00	1	UI			0	GP	pCi/L
Zinc-65	-3.1E-01	1	UI			0	TM	-1.2E+01	1	UI			0	GP	pCi/L
Zirconium-95	6.5E-01	1	UI			0	TM	-4.5E+00	1	UI			0	GP	pCi/L

● = exceeded holding time.

■ = exceeded screening level, final PDWS, or SCDHEC-proposed groundwater monitoring standard.

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Appendix A

Standards

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**Table 1. South Carolina Department of Health and Environmental Control
Proposed Groundwater Monitoring Standards (SCDHEC, 1989)**

Analyte	Standard	Unit
Antimony	50	µg/L
Arsenic	50	µg/L
Barium	1,000	µg/L
Cadmium	10	µg/L
Chromium	50	µg/L
Lead	10	µg/L
Mercury	2	µg/L
Nitrate as nitrogen	10,000	µg/L
Nitrite as nitrogen	1,000	µg/L
Selenium	10	µg/L
Silver	50	µg/L

Note: Benzene and toluene concentrations are not to exceed concentrations or amounts that interfere with use, actual or intended, as determined by SCDHEC. Proposed standards for radionuclides at SRS are under jurisdictional assessment; therefore, no radionuclide standards are proposed for groundwater quality monitoring for the current permit application.

Table 2. Final Primary Drinking Water Standards

Analyte	Level	Unit	Status	Source
Alachlor	2	µg/L	Final	EPA, 1993
Aldicarb ^a	3	µg/L	Final	EPA, 1993
Aldicarb sulfone ^a	2	µg/L	Final	EPA, 1993
Aldicarb sulfoxide ^a	4	µg/L	Final	EPA, 1993
Antimony	6	µg/L	Final	EPA, 1993
Arsenic	50	µg/L	Final	EPA, 1993
Asbestos	7,000,000	Fibers/L	Final	EPA, 1993
Atrazine	3	µg/L	Final	EPA, 1993
Barium	2,000	µg/L	Final	EPA, 1993
Benzene	5	µg/L	Final	EPA, 1993
Benzo[a]pyrene	0.2	µg/L	Final	EPA, 1993
Beryllium	4	µg/L	Final	EPA, 1993
Bis(2-ethylhexyl) phthalate	6	µg/L	Final	EPA, 1993
Bromodichloromethane	100	µg/L	Final	EPA, 1993
Bromoform	100	µg/L	Final	EPA, 1993
2-sec-Butyl-4,6-dinitrophenol	7	µg/L	Final	EPA, 1993
Cadmium	5	µg/L	Final	EPA, 1993
Carbofuran	40	µg/L	Final	EPA, 1993
Carbon tetrachloride	5	µg/L	Final	EPA, 1993
Chlordane	2	µg/L	Final	EPA, 1993
Chlorobenzene	100	µg/L	Final	EPA, 1993
Chloroethene (Vinyl chloride)	2	µg/L	Final	EPA, 1993
Chloroform	100	µg/L	Final	EPA, 1993
Chromium	100	µg/L	Final	EPA, 1993
Copper	1,300	µg/L	Final	EPA, 1993
Cyanide	200	µg/L	Final	EPA, 1993
Dalapon ^a	200	µg/L	Final	EPA, 1993
Dibromochloromethane	100	µg/L	Final	EPA, 1993
1,2-Dibromo-3-chloropropane	0.2	µg/L	Final	EPA, 1993
1,2-Dibromoethane	0.05	µg/L	Final	EPA, 1993
1,2-Dichlorobenzene	600	µg/L	Final	EPA, 1993
1,4-Dichlorobenzene	75	µg/L	Final	EPA, 1993
1,2-Dichloroethane	5	µg/L	Final	EPA, 1993
1,1-Dichloroethylene	7	µg/L	Final	EPA, 1993
1,2-Dichloroethylene	50	µg/L	Final	EPA, 1993
cis-1,2-Dichloroethylene	70	µg/L	Final	EPA, 1993
trans-1,2-Dichloroethylene	100	µg/L	Final	EPA, 1993
Dichloromethane (Methylene chloride)	5	µg/L	Final	EPA, 1993
2,4-Dichlorophenoxyacetic acid	70	µg/L	Final	EPA, 1993
1,2-Dichloropropane	5	µg/L	Final	EPA, 1993
Di(2-ethylhexyl) adipate ^a	400	µg/L	Final	EPA, 1993
Diquat dibromide ^a	20	µg/L	Final	EPA, 1993
Endothall ^a	100	µg/L	Final	EPA, 1993
Endrin	2	µg/L	Final	EPA, 1993
Ethylbenzene	700	µg/L	Final	EPA, 1993
Fluoride	4,000	µg/L	Final	EPA, 1993
Glyphosate ^a	700	µg/L	Final	EPA, 1993
Gross alpha ^b	1.5E+01	pCi/L	Final	EPA, 1993

Analyte	Level	Unit	Status	Source
Heptachlor	0.4	µg/L	Final	EPA, 1993
Heptachlor epoxide	0.2	µg/L	Final	EPA, 1993
Hexachlorobenzene	1	µg/L	Final	EPA, 1993
Hexachlorocyclopentadiene	50	µg/L	Final	EPA, 1993
Lead	50	µg/L	Final	SCDHEC, 1981
Lindane	0.2	µg/L	Final	EPA, 1993
Mercury	2	µg/L	Final	EPA, 1993
Methoxychlor	40	µg/L	Final	EPA, 1993
Nickel	100	µg/L	Final	EPA, 1993
Nitrate as nitrogen	10,000	µg/L	Final	EPA, 1993
Nitrate-nitrite as nitrogen	10,000	µg/L	Final	EPA, 1993
Nitrite as nitrogen	1,000	µg/L	Final	EPA, 1993
Nonvolatile beta	5E+01	pCi/L	Interim Final	EPA, 1977
Oxamyl ^a	200	µg/L	Final	EPA, 1993
PCB 1016	0.5	µg/L	Final	EPA, 1993
PCB 1221	0.5	µg/L	Final	EPA, 1993
PCB 1232	0.5	µg/L	Final	EPA, 1993
PCB 1242	0.5	µg/L	Final	EPA, 1993
PCB 1248	0.5	µg/L	Final	EPA, 1993
PCB 1254	0.5	µg/L	Final	EPA, 1993
PCB 1260	0.5	µg/L	Final	EPA, 1993
PCB 1262	0.5	µg/L	Final	EPA, 1993
Pentachlorophenol	1	µg/L	Final	EPA, 1993
Picloram ^a	500	µg/L	Final	EPA, 1993
Selenium	50	µg/L	Final	EPA, 1993
Simazine ^a	4	µg/L	Final	EPA, 1993
Strontium-89/90 ^c	8E+00	pCi/L	Final	EPA, 1993
Strontium-90	8E+00	pCi/L	Final	EPA, 1993
Styrene	100	µg/L	Final	EPA, 1993
2,3,7,8-TCDD	0.00003	µg/L	Final	EPA, 1993
Tetrachloroethylene	5	µg/L	Final	EPA, 1993
Thallium	2	µg/L	Final	EPA, 1993
Toluene	1,000	µg/L	Final	EPA, 1993
Toxaphene	3	µg/L	Final	EPA, 1993
2,4,5-TP (Silvex)	50	µg/L	Final	EPA, 1993
1,2,4-Trichlorobenzene	70	µg/L	Final	EPA, 1993
1,1,1-Trichloroethane	200	µg/L	Final	EPA, 1993
1,1,2-Trichloroethane	5	µg/L	Final	EPA, 1993
Trichloroethylene	5	µg/L	Final	EPA, 1993
Tritium	2E+01	pCi/mL	Final	EPA, 1993
Xylenes	10,000	µg/L	Final	EPA, 1993

^a At present, EMS does not perform this analysis because the constituent is not in the current contract.

^b The standard given is for gross alpha including radium-226 but excluding radon and uranium.

^c For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.

References Cited

EPA (U.S. Environmental Protection Agency), 1977. **National Interim Primary Drinking Water Regulations**, EPA-570/9-76-003. Washington, DC.

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SCDHEC (South Carolina Department of Health and Environmental Control), 1981. **State Primary Drinking Water Regulations**, R.61–58.5. Columbia, SC.

SCDHEC (South Carolina Department of Health and Environmental Control), 1989. **Industrial Solid Waste Permit Application for the Proposed Z-Area Saltstone Disposal Facility**, Permit 12,683. Columbia, SC.

Appendix B

Flagging Criteria

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Flagging Criteria

The Savannah River Site Environmental Protection Department/Environmental Monitoring Section (EPD/EMS) flagging criteria are as follows:

- Flag 2 criteria for constituents equal the Safe Drinking Water Act (SDWA) final Primary Drinking Water Standards (PDWS), the SDWA proposed PDWS, or the SDWA Secondary Drinking Water Standards (SDWS). If a constituent does not have a drinking water standard, the Flag 2 criterion equals 10 times the method detection limit (MDL) calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.
- Flag 1 criteria for constituents equal one half of the final PDWS, one half the proposed PDWS, or one half the SDWS. If a constituent does not have a drinking water standard, the Flag 1 criterion equals 5 times the MDL calculated as the 90th percentile detection limit obtained recently by one of the primary analytical laboratories.
- Flag 0 criteria are assigned to constituent levels below Flag 1 criteria, constituent levels below the sample detection limits, or constituents having no flagging criteria.

The following parameters are exceptions to the flagging rules:

- EPD/EMS sets flagging criteria for pH and specific conductance. No flags are set for alkalinity, calcium, carbonate, magnesium, potassium, silica, sodium, total dissolved solids, total phosphates (as P), and total phosphorus. Analyses for these parameters are conducted as part of the biennial comprehensive analyses or by special request.
- Aesthetic parameters such as color, corrosivity, Eh, odor, surfactants, and turbidity are not assigned flagging criteria but are analyzed by special request.
- Common laboratory contaminants and cleaners such as dichloromethane (methylene chloride), ketones, phthalates, and toluene are not assigned flagging criteria unless they have PDWS. These constituents are analyzed by special request.

Analyte	Unit	Flag 1	Flag 2	Source ^a
Acenaphthene	µg/L	50	100	EPA Method 8270
Acenaphthylene	µg/L	50	100	EPA Method 8270
Acetone	µg/L	500	1000	EPA Method 8240
Acetonitrile (Methyl cyanide)	µg/L	500	1000	EPA Method 8240
Acetophenone	µg/L	50	100	EPA Method 8270
2-Acetylaminofluorene	µg/L	50	100	EPA Method 8270
Acrolein	µg/L	100	200	EPA Method 8240
Acrylonitrile	µg/L	100	200	EPA Method 8240
Actinium-228	pCi/L	1.64E+03	3.27E+03	Proposed PDWS (EPA, 1991)
Alachlor	µg/L	1	2	Final PDWS (EPA, 1993a)
Aldicarb ^b	µg/L	1.5	3	Final PDWS (EPA, 1993a)
Aldicarb sulfone ^b	µg/L	1	2	Final PDWS (EPA, 1993a)
Aldicarb sulfoxide ^b	µg/L	2	4	Final PDWS (EPA, 1993a)
Aldrin	µg/L	0.25	0.5	EPA Method 8080
Alkalinity (as CaCO ₃)		No flag	No flag	Set by EPD/EMS
Allyl chloride	µg/L	250	500	EPA Method 8240
Aluminum	µg/L	25	50	SDWS (EPA, 1993b)
Aluminum, dissolved	µg/L	25	50	SDWS (EPA, 1993b)
Aluminum, total recoverable	µg/L	25	50	SDWS (EPA, 1993b)
Americium-241	pCi/L	3.17E+00	6.34E+00	Proposed PDWS (EPA, 1991)
Americium-243	pCi/L	3.19E+00	6.37E+00	Proposed PDWS (EPA, 1991)
4-Aminobiphenyl	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source ^a
Ammonia	µg/L	500	1,000	APHA Method 417B
Ammonia nitrogen	µg/L	500	1,000	EPA Method 350.1
Aniline	µg/L	50	100	EPA Method 8270
Anthracene	µg/L	50	100	EPA Method 8270
Antimony	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony, dissolved	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony, total recoverable	µg/L	3	6	Final PDWS (EPA, 1993a)
Antimony-125	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Aramite	µg/L	50	100	EPA Method 8270
Arsenic	µg/L	25	50	Final PDWS (EPA, 1993a)
Arsenic, dissolved	µg/L	25	50	Final PDWS (EPA, 1993a)
Arsenic, total recoverable	µg/L	25	50	Final PDWS (EPA, 1993a)
Asbestos	Fibers/L	3,500,000	7,000,000	Final PDWS (EPA, 1993a)
Atrazine	µg/L	1.5	3	Final PDWS (EPA, 1993a)
Azobenzene	µg/L	50	100	EPA Method 625
Barium	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium, dissolved	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium, total recoverable	µg/L	1,000	2,000	Final PDWS (EPA, 1993a)
Barium-140 ^c	pCi/L	4.5E+01	9E+01	Interim Final PDWS (EPA, 1977)
Benzene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
alpha-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
beta-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
delta-Benzene hexachloride	µg/L	0.25	0.5	EPA Method 8080
Benzidine	µg/L	250	500	EPA Method 8270
Benzo[a]anthracene	µg/L	0.05	0.1	Proposed PDWS (EPA, 1990)
Benzo[b]fluoranthene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Benzo[k]fluoranthene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Benzoic acid	µg/L	250	500	EPA Method 8270
Benzo[g,h,i]perylene	µg/L	50	100	EPA Method 8270
Benzo[a]pyrene	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
1,4-Benzoquinone	µg/L	50	100	EPA Method 8270
Benzyl alcohol	µg/L	50	100	EPA Method 8270
Beryllium	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium, dissolved	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium, total recoverable	µg/L	2	4	Final PDWS (EPA, 1993a)
Beryllium-7	pCi/L	3E+03	6E+03	Interim Final PDWS (EPA, 1977)
Bis(2-chloroethoxy) methane	µg/L	50	100	EPA Method 8270
Bis(2-chloroethyl) ether	µg/L	50	100	EPA Method 8270
Bis(2-chloroisopropyl) ether	µg/L	50	100	EPA Method 8270
Bis(chloromethyl) ether	µg/L	50	100	EPA Method 8270
Bis(2-ethylhexyl) phthalate	µg/L	3	6	Final PDWS (EPA, 1993a)
Bismuth-214	pCi/L	9.4E+03	1.89E+04	Proposed PDWS (EPA, 1991)
Boron	µg/L	150	300	EPA Method 6010
Boron, dissolved	µg/L	150	300	EPA Method 6010
Boron, total recoverable	µg/L	150	300	EPA Method 6010
Bromide	µg/L	5,000	10,000	EPA Method 300.0
Bromodichloromethane	µg/L	50	100	Final PDWS (EPA, 1993a)
Bromoform	µg/L	50	100	Final PDWS (EPA, 1993a)
Bromomethane (Methyl bromide)	µg/L	5	10	EPA Method 8240

Analyte	Unit	Flag 1	Flag 2	Source ^a
4-Bromophenyl phenyl ether	µg/L	50	100	EPA Method 8270
Butylbenzyl phthalate		No flag	No flag	Set by EPD/EMS
2-sec-Butyl-4,6-dinitrophenol	µg/L	3.5	7	Final PDWS (EPA, 1993a)
Cadmium	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Cadmium, dissolved	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Cadmium, total recoverable	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Calcium		No flag	No flag	Set by EPD/EMS
Calcium, dissolved		No flag	No flag	Set by EPD/EMS
Calcium, total recoverable		No flag	No flag	Set by EPD/EMS
Carbofuran	µg/L	20	40	Final PDWS (EPA, 1993a)
Carbon-14	pCi/L	1E+03	2E+03	Interim Final PDWS (EPA, 1977)
Carbonate		No flag	No flag	Set by EPD/EMS
Carbon disulfide	µg/L	5	10	EPA Method 8240
Carbon tetrachloride	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Cerium-141 ^c	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Cerium-144	pCi/L	1.31E+02	2.61E+02	Proposed PDWS (EPA, 1991)
Cesium-134 ^d	pCi/L	4.07E+01	8.13E+01	Proposed PDWS (EPA, 1991)
Cesium-137	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Chlordane	µg/L	1	2	Final PDWS (EPA, 1993a)
Chloride	µg/L	125,000	250,000	SDWS (EPA, 1993b)
4-Chloroaniline	µg/L	50	100	EPA Method 8270
Chlorobenzene	µg/L	50	100	Final PDWS (EPA, 1993a)
Chlorobenzilate	µg/L	50	100	EPA Method 8270
4-Chloro-m-cresol	µg/L	50	100	EPA Method 8270
Chloroethane	µg/L	5	10	EPA Method 8240
Chloroethene (Vinyl chloride)	µg/L	1	2	Final PDWS (EPA, 1993a)
Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
2-Chloroethyl vinyl ether	µg/L	5	10	EPA Method 8240
Chloroform	µg/L	50	100	Final PDWS (EPA, 1993a)
Chloromethane (Methyl chloride)	µg/L	5	10	EPA Method 8240
2-Chloronaphthalene	µg/L	50	100	EPA Method 8240
2-Chlorophenol	µg/L	50	100	EPA Method 8270
4-Chlorophenyl phenyl ether	µg/L	50	100	EPA Method 8270
Chloroprene	µg/L	1,000	2,000	EPA Method 8240
Chromium	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium, dissolved	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium, total recoverable	µg/L	50	100	Final PDWS (EPA, 1993a)
Chromium-51 ^c	pCi/L	3E+03	6E+03	Interim Final PDWS (EPA, 1977)
Chrysene	µg/L	0.1	0.2	Proposed PDWS (EPA, 1990)
Cobalt	µg/L	20	40	EPA Method 6010
Cobalt, dissolved	µg/L	20	40	EPA Method 6010
Cobalt, total recoverable	µg/L	20	40	EPA Method 6010
Cobalt-57	pCi/L	5E+02	1E+03	Interim Final PDWS (EPA, 1977)
Cobalt-58 ^d	pCi/L	4.5E+03	9E+03	Interim Final PDWS (EPA, 1977)
Cobalt-60	pCi/L	5E+01	1E+02	Interim Final PDWS (EPA, 1977)
Color		No flag	No flag	Set by EPD/EMS
Copper	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Copper, dissolved	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Copper, total recoverable	µg/L	500	1,000	Final PDWS (SCDHEC, 1981)
Corrosivity		No flag	No flag	Set by EPD/EMS

Analyte	Unit	Flag 1	Flag 2	Source ^a
m-Cresol (3-Methylphenol)	µg/L	50	100	EPA Method 8270
o-Cresol (2-Methylphenol)	µg/L	50	100	EPA Method 8270
p-Cresol (4-Methylphenol)	µg/L	50	100	EPA Method 8270
Curium-242	pCi/L	6.65E+01	1.33E+02	Proposed PDWS (EPA, 1991)
Curium-243	pCi/L	4.15E+00	8.3E+00	Proposed PDWS (EPA, 1991)
Curium-243/244 ^o	pCi/L	4.15E+00	8.3E+00	Proposed PDWS (EPA, 1991)
Curium-244	pCi/L	4.92E+00	9.84E+00	Proposed PDWS (EPA, 1991)
Curium-245/246 ^o	pCi/L	3.12E+00	6.23E+00	Proposed PDWS (EPA, 1991)
Curium-246	pCi/L	3.14E+00	6.27E+00	Proposed PDWS (EPA, 1991)
Cyanide	µg/L	100	200	Final PDWS (EPA, 1993a)
Dalapon ^b	µg/L	100	200	Final PDWS (EPA, 1993a)
p,p'-DDD	µg/L	0.5	1	EPA Method 8080
p,p'-DDE	µg/L	0.5	1	EPA Method 8080
p,p'-DDT	µg/L	0.5	1	EPA Method 8080
Diallate	µg/L	50	100	EPA Method 8270
Dibenz[a,h]anthracene	µg/L	0.15	0.3	Proposed PDWS (EPA, 1990)
Dibenzofuran	µg/L	50	100	EPA Method 8270
Dibromochloromethane	µg/L	50	100	Final PDWS (EPA, 1993a)
1,2-Dibromo-3-chloropropane	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
1,2-Dibromoethane	µg/L	0.025	0.05	Final PDWS (EPA, 1993a)
Dibromomethane (Methylene bromide)	µg/L	5	10	EPA Method 8240
Di-n-butyl phthalate		No flag	No flag	Set by EPD/EMS
1,2-Dichlorobenzene	µg/L	300	600	Final PDWS (EPA, 1993a)
1,3-Dichlorobenzene	µg/L	50	100	EPA Method 8270
1,4-Dichlorobenzene	µg/L	37.5	75	Final PDWS (EPA, 1993a)
3,3'-Dichlorobenzidine	µg/L	50	100	EPA Method 8270
trans-1,4-Dichloro-2-butene	µg/L	150	300	EPA Method 8240
Dichlorodifluoromethane	µg/L	5	10	EPA Method 8240
1,1-Dichloroethane	µg/L	5	10	EPA Method 8240
1,2-Dichloroethane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
1,1-Dichloroethylene	µg/L	3.5	7	Final PDWS (EPA, 1993a)
1,2-Dichloroethylene	µg/L	25	50	Final PDWS (EPA, 1993a)
cis-1,2-Dichloroethylene	µg/L	35	70	Final PDWS (EPA, 1993a)
trans-1,2-Dichloroethylene	µg/L	50	100	Final PDWS (EPA, 1993a)
Dichloromethane (Methylene chloride)	µg/L	2.5	5	Final PDWS (EPA, 1993a)
2,4-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,6-Dichlorophenol	µg/L	50	100	EPA Method 8270
2,4-Dichlorophenoxyacetic acid	µg/L	35	70	Final PDWS (EPA, 1993a)
1,2-Dichloropropane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
cis-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
trans-1,3-Dichloropropene	µg/L	5	10	EPA Method 8240
Dieldrin	µg/L	2.5	5	EPA Method 8080
Di(2-ethylhexyl) adipate	µg/L	200	400	Final PDWS (EPA, 1993a)
Diethyl phthalate		No flag	No flag	Set by EPD/EMS
Dimethoate	µg/L	50	100	EPA Method 8270
p-Dimethylaminoazobenzene	µg/L	50	100	EPA Method 8270
p-(Dimethylamino)ethylbenzene	µg/L	50	100	EPA Method 8270
7,12-Dimethylbenz[a]anthracene	µg/L	50	100	EPA Method 8270

Analyte	Unit	Flag 1	Flag 2	Source ^a
3,3'-Dimethylbenzidine	µg/L	50	100	EPA Method 8270
a,a-Dimethylphenethylamine	µg/L	50	100	EPA Method 8270
2,4-Dimethyl phenol	µg/L	50	100	EPA Method 8270
Dimethyl phthalate		No flag	No flag	Set by EPD/EMS
1,3-Dinitrobenzene	µg/L	50	100	EPA Method 8270
2,4-Dinitrophenol	µg/L	250	500	EPA Method 8270
2,4-Dinitrotoluene	µg/L	50	100	EPA Method 8270
2,6-Dinitrotoluene	µg/L	50	100	EPA Method 8270
Di-n-octyl phthalate		No flag	No flag	Set by EPD/EMS
1,4-Dioxane	µg/L	50	100	EPA Method 8270
Diphenylamine	µg/L	50	100	EPA Method 8270
1,2-Diphenylhydrazine	µg/L	50	100	EPA Method 8270
Diquat dibromide ^b	µg/L	10	20	Final PDWS (EPA, 1993a)
Dissolved organic carbon	µg/L	5,000	10,000	EPA Method 9060
Disulfoton	µg/L	50	100	EPA Method 8270
Eh		No flag	No flag	Set by EPD/EMS
Endosulfan I	µg/L	0.5	1	EPA Method 8080
Endosulfan II	µg/L	0.5	1	EPA Method 8080
Endosulfan sulfate	µg/L	0.5	1	EPA Method 8080
Endothall ^b	µg/L	50	100	Final PDWS (EPA, 1993a)
Endrin	µg/L	1	2	Final PDWS (EPA, 1993a)
Endrin aldehyde	µg/L	0.5	1	EPA Method 8080
Endrin ketone		No flag	No flag	Set by EPD/EMS
Ethylbenzene	µg/L	350	700	Final PDWS (EPA, 1993a)
Ethyl methacrylate	µg/L	50	100	EPA Method 8270
Ethyl methanesulfonate	µg/L	50	100	EPA Method 8270
Europium-152	pCi/L	3E+01	6E+01	Interim Final PDWS (EPA, 1977)
Europium-154	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Europium-155	pCi/L	3E+02	6E+02	Interim Final PDWS (EPA, 1977)
Famphur	µg/L	50	100	EPA Method 8270
Fluoranthene	µg/L	50	100	EPA Method 8270
Fluorene	µg/L	50	100	EPA Method 8270
Fluoride	µg/L	2,000	4,000	Final PDWS (EPA, 1993a)
Glyphosate ^b	µg/L	350	700	Final PDWS (EPA, 1993a)
Gross alpha	pCi/L	7.5E+00	1.5E+01	Final PDWS (EPA, 1993a)
Heptachlor	µg/L	0.2	0.4	Final PDWS (EPA, 1993a)
Heptachlor epoxide	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
Heptachlorodibenzo-p-dioxin isomers	µg/L	0.00325	0.0065	EPA Method 8280
1,2,3,4,6,7,8-HPCDD	µg/L	0.00325	0.0065	EPA Method 8280
Heptachlorodibenzo-p-furan isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,6,7,8-HPCDF	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorobenzene	µg/L	0.5	1	Final PDWS (EPA, 1993a)
Hexachlorobutadiene	µg/L	50	100	EPA Method 8270
Hexachlorocyclopentadiene	µg/L	25	50	Final PDWS (EPA, 1993a)
Hexachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
1,2,3,4,7,8-HXCDD	µg/L	0.00225	0.0045	EPA Method 8280
Hexachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280

Analyte	Unit	Flag 1	Flag 2	Source ^a
1,2,3,4,7,8-HXCDF	µg/L	0.002	0.004	EPA Method 8280
Hexachloroethane	µg/L	50	100	EPA Method 8270
Hexachlorophene	µg/L	250	500	EPA Method 8270
Hexachloropropene	µg/L	50	100	EPA Method 8270
2-Hexanone	µg/L	50	100	EPA Method 8240
Indeno[1,2,3-c,d]pyrene	µg/L	50	100	EPA Method 8270
Iodine	µg/L	250	500	APHA Method 415A
Iodine-129	pCi/L	5E-01	1E+00	Interim Final PDWS (EPA, 1977)
Iodine-131 ^c	pCi/L	1.5E+00	3E+00	Interim Final PDWS (EPA, 1977)
Iodomethane (Methyl iodide)	µg/L	75	150	EPA Method 8240
Iron	µg/L	150	300	SDWS (EPA, 1993b)
Iron, dissolved	µg/L	150	300	SDWS (EPA, 1993b)
Iron, total recoverable	µg/L	150	300	SDWS (EPA, 1993b)
Iron-55 ^c	pCi/L	1E+03	2E+03	Interim Final PDWS (EPA, 1977)
Iron-59 ^c	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Isobutyl alcohol	µg/L	500	1,000	EPA Method 8240
Isodrin	µg/L	50	100	EPA Method 8270
Isophorone	µg/L	50	100	EPA Method 8270
Isosafrole	µg/L	50	100	EPA Method 8270
Kepone	µg/L	50	100	EPA Method 8270
Lanthanum-140 ^c	pCi/L	3E+01	6E+01	Interim Final PDWS (EPA, 1977)
Lead	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead, dissolved	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead, total recoverable	µg/L	25	50	Final PDWS (SCDHEC, 1981)
Lead-212	pCi/L	6.2E+01	1.23E+02	Proposed PDWS (EPA, 1991)
Lindane	µg/L	0.1	0.2	Final PDWS (EPA, 1993a)
Lithium	µg/L	25	50	EPA Method 6010
Lithium, dissolved	µg/L	25	50	EPA Method 6010
Lithium, total recoverable	µg/L	25	50	EPA Method 6010
Magnesium		No flag	No flag	Set by EPD/EMS
Magnesium, dissolved		No flag	No flag	Set by EPD/EMS
Magnesium, total recoverable		No flag	No flag	Set by EPD/EMS
Manganese	µg/L	25	50	SDWS (EPA, 1993b)
Manganese, dissolved	µg/L	25	50	SDWS (EPA, 1993b)
Manganese, total recoverable	µg/L	25	50	SDWS (EPA, 1993b)
Manganese-54	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Mercury	µg/L	1	2	Final PDWS (EPA, 1993a)
Mercury, dissolved	µg/L	1	2	Final PDWS (EPA, 1993a)
Mercury, total recoverable	µg/L	1	2	Final PDWS (EPA, 1993a)
Methacrylonitrile	µg/L	250	500	EPA Method 8240
Methapyrilene	µg/L	50	100	EPA Method 8270
Methoxychlor	µg/L	20	40	Final PDWS (EPA, 1993a)
3-Methylcholanthrene	µg/L	50	100	EPA Method 8270
2-Methyl-4,6-dinitrophenol	µg/L	250	500	EPA Method 8270
Methyl ethyl ketone		No flag	No flag	Set by EPD/EMS
Methyl isobutyl ketone		No flag	No flag	Set by EPD/EMS
Methyl methacrylate	µg/L	50	100	EPA Method 8270
Methyl methanesulfonate	µg/L	50	100	EPA Method 8270
2-Methylnaphthalene	µg/L	50	100	EPA Method 8270
Molybdenum	µg/L	250	500	EPA Method 6010

Analyte	Unit	Flag 1	Flag 2	Source ^a
Molybdenum, dissolved	µg/L	250	500	EPA Method 6010
Molybdenum, total recoverable	µg/L	250	500	EPA Method 6010
Naphthalene	µg/L	50	100	EPA Method 8270
1,4-Naphthoquinone	µg/L	50	100	EPA Method 8270
1-Naphthylamine	µg/L	50	100	EPA Method 8270
2-Naphthylamine	µg/L	50	100	EPA Method 8270
Neptunium-237	pCi/L	3.53E+00	7.06E+00	Proposed PDWS (EPA, 1991)
Nickel	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel, dissolved	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel, total recoverable	µg/L	50	100	Final PDWS (EPA, 1993a)
Nickel-59 ^c	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Nickel-63 ^c	pCi/L	2.5E+01	5E+01	Interim Final PDWS (EPA, 1977)
Niobium-95 ^c	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Nitrate as nitrogen	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Nitrate-nitrite as nitrogen	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Nitrite as nitrogen	µg/L	500	1,000	Final PDWS (EPA, 1993a)
m-Nitroaniline	µg/L	50	100	EPA Method 8270
o-Nitroaniline	µg/L	50	100	EPA Method 8270
p-Nitroaniline	µg/L	50	100	EPA Method 8270
Nitrobenzene	µg/L	50	100	EPA Method 8270
Nitrogen by Kjeldahl method	µg/L	500	1,000	EPA Method 351.2
2-Nitrophenol	µg/L	50	100	EPA Method 8270
4-Nitrophenol	µg/L	50	100	EPA Method 8270
4-Nitroquinoline-1-oxide	µg/L	50	100	EPA Method 8270
N-Nitrosodi-n-butylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodiethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodimethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodiphenylamine	µg/L	50	100	EPA Method 8270
N-Nitrosodipropylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomethylethylamine	µg/L	50	100	EPA Method 8270
N-Nitrosomorpholine	µg/L	50	100	EPA Method 8270
N-Nitrosopiperidine	µg/L	50	100	EPA Method 8270
N-Nitrosopyrrolidine	µg/L	50	100	EPA Method 8270
5-Nitro-o-toluidine	µg/L	50	100	EPA Method 8270
Nonvolatile beta	pCi/L	2.5E+01	5E+01	Interim Final PDWS (EPA, 1977)
Octachlorodibenzo-p-dioxin isomers	µg/L	0.005	0.01	EPA Method 8280
Octachlorodibenzo-p-furan isomers	µg/L	0.005	0.01	EPA Method 8280
Odor		No flag	No flag	Set by EPD/EMS
Oil & Grease	µg/L	5,000	10,000	EPA Method 413.1
Oxamyl ^b	µg/L	100	200	Final PDWS (EPA, 1993a)
Parathion	µg/L	0.25	0.5	EPA Method 8080
Parathion methyl	µg/L	0.25	0.5	EPA Method 8080
PCB 1016	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1221	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1232	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1242	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1248	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1254	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)

Analyte	Unit	Flag 1	Flag 2	Source ^a
PCB 1260	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
PCB 1262	µg/L	0.25	0.5	Final PDWS (EPA, 1993a)
Pentachlorobenzene	µg/L	50	100	EPA Method 8270
Pentachlorodibenzo-p-dioxin isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-PCDD	µg/L	0.00275	0.0055	EPA Method 8280
Pentachlorodibenzo-p-furan isomers	µg/L	0.00275	0.0055	EPA Method 8280
1,2,3,7,8-PCDF	µg/L	0.00275	0.0055	EPA Method 8280
Pentachloroethane	µg/L	50	100	EPA Method 8270
Pentachloronitrobenzene	µg/L	50	100	EPA Method 8270
Pentachlorophenol	µg/L	0.5	1	Final PDWS (EPA, 1993a)
pH	pH	8	10	Set by EPD/EMS
pH	pH	4	3	Set by EPD/EMS
Phenacetin	µg/L	50	100	EPA Method 8270
Phenanthrene	µg/L	50	100	EPA Method 8270
Phenol	µg/L	50	100	EPA Method 8270
Phenols	µg/L	25	50	EPA Method 420.1
p-Phenylenediamine	µg/L	50	100	EPA Method 8270
Phorate	µg/L	0.5	1	EPA Method 8080
Picloram ^p	µg/L	250	500	Final PDWS (EPA, 1993a)
2-Picoline	µg/L	50	100	EPA Method 8270
Plutonium-238	pCi/L	3.51E+00	7.02E+00	Proposed PDWS (EPA, 1991)
Plutonium-239	pCi/L	3.11E+01	6.21E+01	Proposed PDWS (EPA, 1991)
Plutonium-239/240 ^e	pCi/L	3.11E+01	6.21E+01	Proposed PDWS (EPA, 1991)
Plutonium-240	pCi/L	3.11E+01	6.22E+01	Proposed PDWS (EPA, 1991)
Plutonium-241 ^c	pCi/L	3.13E+01	6.26E+01	Proposed PDWS (EPA, 1991)
Plutonium-242 ^c	pCi/L	3.27E+01	6.54E+01	Proposed PDWS (EPA, 1991)
Potassium		No flag	No flag	Set by EPD/EMS
Potassium, dissolved		No flag	No flag	Set by EPD/EMS
Potassium, total recoverable		No flag	No flag	Set by EPD/EMS
Potassium-40	pCi/L	1.5E+02	3E+02	Proposed PDWS (EPA, 1986)
Promethium-144	pCi/L	5E+01	1E+02	EPA Method 901.1
Promethium-146	pCi/L	5E+01	1E+02	EPA Method 901.1
Promethium-147	pCi/L	2.62E+03	5.24E+03	Proposed PDWS (EPA, 1991)
Pronamid	µg/L	50	100	EPA Method 8270
Propionitrile	µg/L	1,000	2,000	EPA Method 8240
Pyrene	µg/L	50	100	EPA Method 8270
Pyridine	µg/L	50	100	EPA Method 8270
Radium (alpha emitting) ⁱ	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radium-226	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radium-228	pCi/L	1E+01	2E+01	Proposed PDWS (EPA, 1991)
Radon-222	pCi/L	1.5E+02	3E+02	Proposed PDWS (EPA, 1991)
Ruthenium-103 ^c	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Ruthenium-106	pCi/L	1.5E+01	3E+01	Interim Final PDWS (EPA, 1977)
Safrole	µg/L	50	100	EPA Method 8270
Selenium	µg/L	25	50	Final PDWS (EPA, 1993a)
Selenium, dissolved	µg/L	25	50	Final PDWS (EPA, 1993a)
Selenium, total recoverable	µg/L	25	50	Final PDWS (EPA, 1993a)
Silica		No flag	No flag	Set by EPD/EMS
Silica, dissolved		No flag	No flag	Set by EPD/EMS
Silica, total recoverable		No flag	No flag	Set by EPD/EMS

Analyte	Unit	Flag 1	Flag 2	Source ^a
Silver	µg/L	50	100	SDWS (EPA, 1993b)
Silver, dissolved	µg/L	50	100	SDWS (EPA, 1993b)
Silver, total recoverable	µg/L	50	100	SDWS (EPA, 1993b)
Simazine ^b	µg/L	2	4	Final PDWS (EPA, 1993a)
Sodium		No flag	No flag	Set by EPD/EMS
Sodium, dissolved		No flag	No flag	Set by EPD/EMS
Sodium, total recoverable		No flag	No flag	Set by EPD/EMS
Sodium-22	pCi/L	2.33E+02	4.66E+02	Proposed PDWS (EPA, 1991)
Specific conductance	µS/cm	250	500	Set by EPD/EMS
Strontium-89	pCi/L	1E+01	2E+01	Interim Final PDWS (EPA, 1977)
Strontium-89/90 ^e	pCi/L	4E+00	8E+00	Final PDWS (EPA, 1993a)
Strontium-90	pCi/L	4E+00	8E+00	Final PDWS (EPA, 1993a)
Styrene	µg/L	50	100	Final PDWS (EPA, 1993a)
Sulfate	µg/L	200,000	400,000	Proposed PDWS (EPA, 1990)
Sulfide	µg/L	5,000	10,000	EPA Method 9030
Sulfotep	µg/L	50	100	EPA Method 8270
Surfactants		No flag	No flag	Set by EPD/EMS
2,3,7,8-TCDD	µg/L	0.000015	0.00003	Final PDWS (EPA, 1993a)
2,3,7,8-TCDF	µg/L	0.002	0.004	EPA Method 8280
Technetium-99	pCi/L	4.5E+02	9E+02	Interim Final PDWS (EPA, 1977)
1,2,4,5-Tetrachlorobenzene	µg/L	50	100	EPA Method 8270
Tetrachlorodibenzo-p-dioxin isomers	µg/L	0.00225	0.0045	EPA Method 8280
Tetrachlorodibenzo-p-furan isomers	µg/L	0.002	0.004	EPA Method 8280
1,1,1,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
1,1,2,2-Tetrachloroethane	µg/L	5	10	EPA Method 8240
Tetrachloroethylene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
2,3,4,6-Tetrachlorophenol	µg/L	50	100	EPA Method 8270
Thallium	µg/L	1	2	Final PDWS (EPA, 1993a)
Thallium, dissolved	µg/L	1	2	Final PDWS (EPA, 1993a)
Thallium, total recoverable	µg/L	1	2	Final PDWS (EPA, 1993a)
Thionazin	µg/L	50	100	EPA Method 8270
Thorium-228	pCi/L	6.25E+01	1.25E+02	Proposed PDWS (EPA, 1991)
Thorium-230	pCi/L	3.96E+01	7.92E+01	Proposed PDWS (EPA, 1991)
Thorium-232	pCi/L	4.4E+01	8.8E+01	Proposed PDWS (EPA, 1991)
Thorium-234	pCi/L	2E+02	4.01E+02	Proposed PDWS (EPA, 1991)
Tin	µg/L	10	20	EPA Method 282.2
Tin, dissolved	µg/L	10	20	EPA Method 282.2
Tin, total recoverable	µg/L	10	20	EPA Method 282.2
Tin-113 ^c	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Toluene	µg/L	500	1,000	Final PDWS (EPA, 1993a)
o-Toluidine	µg/L	50	100	EPA Method 8270
Total carbon	µg/L	5,000	10,000	EPA Method 9060
Total coliform		0	0	Final PDWS (EPA, 1993a)
Total dissolved solids		No flag	No flag	Set by EPD/EMS
Total hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total inorganic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic carbon	µg/L	5,000	10,000	EPA Method 9060
Total organic halogens	µg/L	25	50	EPA Method 9020
Total organic nitrogen	µg/L	500	1,000	APHA Method 420

Analyte	Unit	Flag 1	Flag 2	Source ^a
Total petroleum hydrocarbons	µg/L	5,000	10,000	EPA Method 418.1
Total phosphates (as P)		No flag	No flag	Set by EPD/EMS
Total phosphorus		No flag	No flag	Set by EPD/EMS
Toxaphene	µg/L	1.5	3	Final PDWS (EPA, 1993a)
2,4,5-TP (Silvex)	µg/L	25	50	Final PDWS (EPA, 1993a)
Tributyl phosphate	µg/L	50	100	EPA Method 8270
1,2,4-Trichlorobenzene	µg/L	35	70	Final PDWS (EPA, 1993a)
1,1,1-Trichloroethane	µg/L	100	200	Final PDWS (EPA, 1993a)
1,1,2-Trichloroethane	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Trichloroethylene	µg/L	2.5	5	Final PDWS (EPA, 1993a)
Trichlorofluoromethane	µg/L	5	10	EPA Method 8240
2,4,5-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,6-Trichlorophenol	µg/L	50	100	EPA Method 8270
2,4,5-Trichlorophenoxyacetic acid	µg/L	2.5	5	EPA Method 8150
1,2,3-Trichloropropane	µg/L	5	10	EPA Method 8240
O,O,O-Triethyl phosphorothioate	µg/L	50	100	EPA Method 8270
1,3,5-Trinitrobenzene	µg/L	50	100	EPA Method 8270
Tritium	pCi/mL	1E+01	2E+01	Final PDWS (EPA, 1993a)
Turbidity ^b		No flag	No flag	Set by EPD/EMS
Uranium	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium, dissolved	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium, total recoverable	µg/L	10	20	Proposed PDWS (EPA, 1991)
Uranium alpha activity	pCi/L	1.5E+01	3E+01	Proposed PDWS (EPA, 1991)
Uranium-233/234 ^c	pCi/L	6.9E+00	1.38E+01	Proposed PDWS (EPA, 1991)
Uranium-234	pCi/L	6.95E+00	1.39E+01	Proposed PDWS (EPA, 1991)
Uranium-235	pCi/L	7.25E+00	1.45E+01	Proposed PDWS (EPA, 1991)
Uranium-238	pCi/L	7.3E+00	1.46E+01	Proposed PDWS (EPA, 1991)
Vanadium	µg/L	40	80	EPA Method 6010
Vanadium, dissolved	µg/L	40	80	EPA Method 6010
Vanadium, total recoverable	µg/L	40	80	EPA Method 6010
Vinyl acetate	µg/L	5	10	EPA Method 8240
Xylenes	µg/L	5,000	10,000	Final PDWS (EPA, 1993a)
Yttrium-88	pCi/L	5E+01	1E+02	EPA Method 901.1
Zinc	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc, dissolved	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc, total recoverable	µg/L	2,500	5,000	SDWS (EPA, 1993b)
Zinc-65	pCi/L	1.5E+02	3E+02	Interim Final PDWS (EPA, 1977)
Zirconium-95 ^c	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)
Zirconium/Niobium-95 ^c	pCi/L	1E+02	2E+02	Interim Final PDWS (EPA, 1977)

^a References for methods are in Appendix E; references for dated sources are at the end of this appendix.

^b EMS is currently unable to perform this analysis.

^c EMS discontinued monitoring this radionuclide because it is inappropriate for the SRS Groundwater Monitoring Program.

^d EPD/EMS set this flagging criterion using the 1991 proposed PDWS because the final PDWS in 1977 may have been in error.

^e For double radionuclide analyses where each separate radionuclide has its own standard, the more stringent standard is used.

^f The applied standard is for radium 226.

^g The primary maximum contaminant level range for turbidity is 1-5 NTU, which is inappropriate for the SRS Groundwater Monitoring Program.

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