



June 1, 2009
NND-09-0148

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

ATTN: Document Control Desk

Subject: V. C. Summer Nuclear Station Units 2 and 3
Docket Numbers 52-027 and 52-028
Combined License Application – Environmental Report Audit
Information Needs: G-3, GW-4, HP-6, HP-10, HP-11, LU-4, and
SE-1

- Reference:
1. Letter from S.A. Byrne to Document Control Desk, Submittal of a Combined License Application for V. C. Summer Nuclear Station Units 2 and 3, dated March 27, 2008.
 2. Letter from Ronald B. Clary to Document Control Desk, Submittal of Revision 1 to Part 3 (Environmental Report) of the Combined License Application for the V. C. Summer Nuclear Station Units 2 and 3, dated February 13, 2009.

By letter dated March 27, 2008, South Carolina Electric & Gas Company (SCE&G) submitted a combined license application (COLA) for two Westinghouse AP1000 units, designated V.C. Summer Nuclear Station (VCSNS) Units 2 and 3, to be located at the existing VCSNS site in Fairfield County, South Carolina. Subsequently the Environmental Report (ER), Part 3 of the application, was revised and submitted to the NRC (reference 2).

During the week of March 9, 2009, the NRC conducted an Environmental Audit to gather information to assist in the review of the ER. The purpose of this letter is to submit a portion of the ER Information Needs identified by the NRC including: G-3, GW-4, HP-6, HP-10, HP-11, LU-4, and SE-1.

Please address any questions to Mr. Alfred M. Paglia, Manager, Nuclear Licensing, New Nuclear Deployment, P. O. Box 88, Jenkinsville, S.C. 29065; by telephone at 803-345-4191; or by email at apaglia@scana.com.

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NRW

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 1st day of June 2009



Ronald B. Clary
General Manager
New Nuclear Deployment

ARR/RBC/ar

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VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

Information Item Number: G-3 Revision: 0

Statement of the Information Item:

Information Item G-3:

Provide expert(s) in appropriate disciplines to discuss the contents of Tables 10.1-1 ('Construction-Related Unavoidable Adverse Environmental Impacts') and 10.1-2 ('Operations-Related Unavoidable Adverse Environmental Impacts'). It is anticipated that these topics will be addressed in specific breakout sessions for the individual disciplines.

Specific Audit Observation:

During a break out session addressing Section 10.4, the NRC socioeconomic analyst observed that ER Section 10.1 did not address any proactive measures to be taken by SCE&G to mitigate any impacts to social or public services. The NRC analyst noted that the ER for another AP1000 COLA identified proactive communication as mitigation for such impacts and encouraged SCE&G to get in contact with local officials to understand their concerns.

Response:

To address this NRC observation, ER Section 10.1 will be revised in a future revision of the COLA, to include a mitigation measure that SCE&G would communicate with local officials regarding construction worker influx numbers and timing to enable officials to plan accordingly.

COLA Revisions:

ER Section 10.1 and Table 10.1-1 will be revised in a future revision of the COLA as follows:

3rd paragraph of Section 10.1.1

As presented in Chapter 4 and Table 10.1-1, the unavoidable adverse impacts from construction would include the removal of 434 acres of pine forest and hardwoods, concomitant loss or displacement of animals, sediment loading in waterbodies, small gradual increase in population and resultant increased demand for public and social services, additional traffic on local roads, and an increase in noise, fugitive dust, and air pollution from exhaust emissions from commuting vehicles and construction equipment. The impacts, other than socioeconomic, from the construction of new units would be SMALL. The traffic impact on local roads in Fairfield and Newberry Counties would be MODERATE to LARGE and would be mitigated by a construction management traffic plan developed before the start of construction.

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

Table 10.1-1, sheet 7 of 7, add to end of socioeconomics row

<u>Socioeconomics</u>	<u>Increased demand for public and social services due to increase in population</u>	<u>SCE&G would communicate with county officials concerning the number and schedule for influx of construction workers in advance and continue to keep the officials apprised of their activities that could impact the county infrastructure throughout construction.</u>	<u>Increased demand for public and social services from local departments and agencies.</u>
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VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

Information Item Number: GW-4 Revision: 0

Statement of the Information Item:

Information Item GW-4:

Provide an expert to discuss occurrence of springs/seeps in the area or other features that may be indicative of groundwater flow focused in larger-scale, interconnected fractures/joints.

SCE&G Follow Up Action:

Provide discussion of observation of springs related to the Units 2 and 3 site area.

Response:

Streams and wetlands in the area of VCSNS Units 2 and 3 have been identified and surveyed. ER Figure 2.3-20 presents the mapped wetland areas. The headwaters of tributaries to Mayo Creek and other small unnamed creeks in the area are ephemeral and eventually become perennial downstream as indicated on the USGS topographic map presented as FSAR Figure 2.5.1-222.

A single intermittent seep has been observed southwest of observation well OW-627B (well location shown in FSAR Figure 2.4-233). The nature of the seep suggests it is a temporary feature, likely occurring after precipitation events and indicative of flow through the saprolite.

Field reconnaissance and areal photography interpretation have not identified any surface features or large permanent springs that would indicate the presence of large scale interconnected fractures/joints.

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-6 Revision: 0

Statement of the Information Needs Item:

Information Needs Item HP-6:

Provide one or more experts to discuss the models, assumptions, and input data used to arrive at the estimates for doses to construction workers, public, and biota from Unit 1 and the proposed Units 2 and 3. Provide experts to discuss all non-default assumptions used in LADTAP II and GASPAR II.

Requested Action:

Applicant to justify use of ½ mile for biota dose calculation with consideration given to the fact that wildlife can roam within ½ mile.

Response:

ER Section 5.4 will be revised to assume that biota are located at a distance of 0.25 mile from the plant. As this is half the distance to the EAB, it is representative of the average onsite location of biota over the course of a year. This is believed to be conservative since it is assumed that species such as heron, duck, and muskrat would not likely spend much time this close to the facility. Biota doses will be revised to reflect the change to this nearer location. ER revisions shown within this response also reflect revisions from Item HP-10.

Note: Units 2 and 3 doses reflected in this response are based on 2007 meteorological data.

COLA Revisions:

In a future ER revision, Table 5.4-5 will be revised as follows:

Table 5.4-5
Gaseous Pathway Receptor Locations

Receptor	Direction ^(a)	Distance (miles)
Site Boundary	SE, ENE	0.50
Maximally exposed individual	SE	1.68
<u>Biota</u>	<u>SE, ENE</u>	<u>0.25</u>

a) For the site boundary and the biota, the maximum atmospheric dispersion factors occur in the SE direction while the maximum ground deposition takes place in the ENE direction.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-6 Revision: 0

In response to this information need as well as Item HP-10 regarding low river flow for liquid effluent doses, ER Table 5.4-10 will be revised as follows:

Table 5.4-10
Doses to Biota from Liquid and Gaseous Effluents – Units 2 and 3

Biota	Dose (millirad/year)		
	Liquid effluents ^(a)	Gaseous effluents ^(b)	Total
Fish	<u>0.300.82</u>	0	<u>0.300.82</u>
Muskrat	<u>0.902.4</u>	<u>1.65.0</u>	<u>2.57.5</u>
Raccoon	<u>0.350.96</u>	<u>2.37.4</u>	<u>2.78.4</u>
Heron	<u>4.111</u>	<u>1.65.0</u>	<u>5.716</u>
Duck	<u>0.862.3</u>	<u>2.37.4</u>	<u>3.29.7</u>

a) Using Parr Reservoir water.

b) ~~Assumed residing at site boundary.~~ Adult pathway doses from GASPAR II for plume, vegetation ingestion (except herons and muskrats) and inhalation; ground exposure taken as twice adult. Relative Biological Effectiveness equals one.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

Statement of the Information Needs Item:

Information Needs Item HP-10:

Provide an expert (i.e., the principal author(s) of the radiological sections of the ER) to discuss the source term, liquid and gaseous release points, transport and exposures used to calculate doses to construction workers, and MEI and population doses.

Requested Action:

Three Actions for applicant

1. Clarify how the two directions to the EAB are used in Table 5.4-5
2. In Tables 2.7-16 and 2.7-18, need to clarify where the measurement point of reference is from.
3. Table 5.4-1 Use low river flow for liquid effluent doses.

Response:

The ER will be revised as follows:

1. A footnote will be added to Table 5.4-5 to clarify that for the EAB the maximum atmospheric dispersion factors occur in the SE direction while the maximum ground deposition takes place in the ENE direction.
2. In Table 2.7-16, a footnote will be added to explain that distances for the Residences, Dose Evaluation Periphery, Meat Animals, Milk Animals and Vegetable Gardens were measured from the edge of the Power Block Area (PBA) to the receptors. The distance for the Unit 3 Reactor was measured from the center of Unit 2 containment to the center of Unit 3 containment.

In Table 2.7-18, a footnote will be added to explain that distances for the Residences, EAB, Meat Animals, Milk Animals and Vegetable Gardens were measured from the edge of the PBA to the receptors. The distance for the Unit 3 Reactor was measured from the center of Unit 2 containment to the center of Unit 3 containment.
3. The third entry in Table 5.4-1 will be revised to reflect the lowest average annual river flow rate recorded since 1981, as reported by the U.S. Geological Survey. Table footnote "a" will also be revised to clarify that the minimum recorded value is being used. The liquid effluent doses in Subsection 5.4.2.1 and Tables 5.4-2, 5.4-7, 5.4-8, 5.4-9, 5.4-10, and 5.10-1 will also be revised to reflect the change in river flow rate.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

Notes:

1. During the review of this information need, a discrepancy was identified between the annual total body dose to a construction worker during the construction of the new units shown in Section 5.4.5 and shown in Table 4.5-1. The revision to Section 5.4.5 to be included in a future revision of the ER is provided below.
2. Units 2 and 3 doses reflected in this response are based on 2007 meteorological data.
3. ER revisions shown within this response also reflect revisions from Item HP-6.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

COLA Revisions:

In a future ER revision, the third entry in Table 5.4-1 and its associated footnote will be revised as follows:

Table 5.4-1
Liquid Pathway Parameters

Parameter	Value
Discharge rate = river flow rate	4,811,782 cubic feet per second ^(a)

- a) Assumed fully mixed model with the minimum annual average Broad River flow rate at Alston, SC for ~~1981-1982 and 1997-2006~~, United States Geological Survey, 2007~~9~~

The last sentence of Subsection 5.4.2.1 will be revised as follows:

The maximum annual organ dose from liquid releases of ~~0.17~~0.50 millirem per unit would be to the GI tract of the MEI (adult).

Table 5.4-2 will be revised as follows:

Table 5.4-2
Liquid Pathway Doses for Maximally Exposed Individual – 1 Unit

(millirem per year)							
Skin	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI Tract ^(a)
0.0004438 ^(b)	0.04412 ^(c)	0.08323 ^(c)	0.05414 ^(d)	0.07019 ^(c)	0.05016 ^(c)	0.04412 ^(c)	0.1750 ^(d)

- a) Gastrointestinal lining of lower intestine
 b) teenager
 c) child
 d) adult

VCSNS UNITS 2 and 3

- Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

In response to this information need as well as Item HP-6, ER Table 5.4-5 will be revised as follows:

**Table 5.4-5
Gaseous Pathway Receptor Locations**

Receptor	Direction ^(a)	Distance (miles)
Site Boundary	SE, ENE	0.50
Maximally exposed individual	SE	1.68
<u>Biota</u>	<u>SE, ENE</u>	<u>0.25</u>

a) For the site boundary and the biota, the maximum atmospheric dispersion factors occur in the SE direction while the maximum ground deposition takes place in the ENE direction.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

Table 5.4-7 will be revised as follows:

Table 5.4-7
Comparison of Annual Doses with 10 CFR 50, Appendix I Criteria

Type of Dose	Location	Annual Dose	
		Unit 2 or 3	Limit
Liquid effluent ^(a)			
Total body (millirem)	Parr Reservoir	0.054 <u>14</u>	3
Maximum organ – liver <u>GI-LLI</u> (millirem)	Parr Reservoir	0.175 <u>0</u>	10
Gaseous effluent ^(b)			
Gamma air (millirad)	Site boundary	0.74	10
Beta air (millirad)	Site boundary	3.1	20
Total external body (millirem)	Site boundary	0.60	5
Skin (millirem)	Site boundary	2.4	15
Iodines and particulates ^(c) (gaseous effluents)			
Maximum organ – thyroid (millirem)	1.68 miles, SE	7.2 ^(d)	15

- a) Total body and GI LLI doses ~~is are~~ for an adult using the Parr Reservoir. ~~The liver dose is for a child using the Parr Reservoir.~~
- b) Southeast Site Boundary. Ground Level releases assumed.
- c) Includes Tritium and Carbon-14 Terrestrial food chain dose (and inhalation dose for calculation ease and conservatism), consistent with Table 1 of Regulatory Guide 1.109.
- d) Infant drinking home-produced goat milk.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

Table 5.4-8 will be revised as follows:

Table 5.4-8

**Comparison of Maximally Exposed Individual Doses with 40 CFR 190 Criteria
(millirem/year)**

	Units 2 and 3			Unit 1 ^(c) Total	Site Total	Regulatory Limit
	Liquid	Gaseous	Total			
Total body ^(a)	<u>0.4028</u>	0.80	<u>0.901.1</u>	1.2	<u>2.1.3</u>	25
Thyroid ^(b)	<u>0.4438</u>	14.4 ^(c)	<u>44.615</u>	0.043	<u>44.615</u>	75
Other organ – bone ^(a)	<u>0.08223</u> (d)	3.3	<u>3.46</u>	0.043	<u>3.56</u>	25

a) Residence with garden, dose to child, 1.68 miles SE of new units.

b) Residence with goat, infant drinking goat milk, 1.68 miles SE of new units.

c) At location of new units maximally exposed individual.

d) Maximum other organ doses for liquid pathway is 0.341.0 mrem/yr to the GI-LLI. (two new units).

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

Table 5.4-9 will be revised as follows:

Table 5.4-9

Collective Total Body Doses within 50 Miles (person-rem per year)

	Units 2 and 3	
	Liquid	Gaseous
Noble gases	0	2.5
Iodines and particulates	<u>7.420</u>	0.49
Tritium and C-14	<u>3.49.3</u>	2.8
Total	<u>10.829</u>	5.8
Natural background ^(a)	7.7×10^5	

a) Natural background dose is based on a dose rate of 360 millirem/person/yr and a projected 2060 population of 2,131,394 (Table 2.5 -1).

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

In response to this information need as well as Item HP-6, ER Table 5.4-10 will be revised as follows:

Table 5.4-10
Doses to Biota from Liquid and Gaseous Effluents – Units 2 and 3

Biota	Dose (millirad/year)		Total
	Liquid effluents ^(a)	Gaseous effluents ^(b)	
Fish	0.300 <u>0.82</u>	0	0.300 <u>0.82</u>
Muskrat	0.90 <u>2.4</u>	1.65 <u>0</u>	2.57 <u>5</u>
Raccoon	0.35 <u>0.96</u>	2.37 <u>4</u>	2.78 <u>4</u>
Heron	4.11	1.65 <u>0</u>	5.71 <u>6</u>
Duck	0.86 <u>2.3</u>	2.37 <u>4</u>	3.29 <u>7</u>

a) Using Parr Reservoir water.

b) ~~Assumed residing at site boundary.~~ Adult pathway doses from GASPAR II for plume, vegetation ingestion (except herons and muskrats) and inhalation; ground exposure taken as twice adult. Relative Biological Effectiveness equals one.

In ER Table 5.10-1 (Sheet 4 of 9), the entry for Subsection 5.4.2 will be revised as follows:

Potential liquid pathway doses would be ~~0.05~~10.14 millirem per year for total body for the maximally exposed individual and ~~29.0~~ person-rem per year for collective total body doses to the public within 50 miles.

In ER Section 5.4.5, the next to the last sentence will be revised as follows:

The annual total body dose to a construction worker during the construction of the new units is ~~4.4~~ 1.2 millirem, as shown in Table 4.5-1.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

ER Table 2.7-16 will be revised as shown below in a future revision of the COLA ER,

Table 2.7-16
XOQDOQ-Predicted Maximum X/Q and D/Q Values at Receptors of Interest

Type of Location	Direction from Site	Distance (miles) ^b	X/Q (sec/m3) (No Decay)	X/Q (sec/m3) (2.26-Day Decay)	X/Q (sec/m3) (8-Day Decay)	D/Q (1/m2)
Residence	East-Northeast	1.30	—	—	—	3.4E-09
	Southeast	1.68	9.0E-07	8.9E-07	7.5E-07	—
Dose Evaluation Periphery	East-Northeast	0.50	—	—	—	1.7E-08
	Southeast	0.50	6.0E-06	6.0E-06	5.5E-06	—
Meat Animal	West-Northwest	1.74	4.6E-07	4.6E-07	3.9E-07	—
	Northeast	2.14	—	—	—	1.4E-09
Milk Animal	West	4.74	1.2E-07	1.2E-07	9.2E-08	2.0E-10
Vegetable Garden	East	1.23	—	—	—	2.9E-09
	Southeast	1.68	9.0E-07	8.9E-07	7.5E-07	—
Unit 3 Reactor ^a	South/Southwest	0.17	1.6E-05	1.6E-05	1.5E-05	—
	Southwest	0.17	—	—	—	6.5E-08

a) X/Q values at the Unit 3 Reactor location are used in evaluation of construction worker doses.

b) The distances for the Residences, Dose Evaluation Periphery, Meat Animals, Milk Animals and Vegetable Gardens were measured from the edge of the PBA to the receptors. The distance for the Unit 3 Reactor was measured from the center of Unit 2 containment to the center of Unit 3 containment.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-10

Revision: 0

ER Table 2.7-18 will be revised as shown below in a future revision of the COLA ER.

Table 2.7-18
Long-Term Average X/Q and D/Q Values for Routine Releases at Specific Receptors of Interest

TYPE OF LOCATION	DIRECTION FROM SITE	DISTANCE ^a (MILES)	(MEYERS)	X/Q	X/Q	X/Q	D/Q
				(SEC/CUB.METER) NO DECAY UNDEPLETED	(SEC/CUB.METER) 2,260 DAY DECAY UNDEPLETED	(SEC/CUB.METER) 8,000 DAY DECAY DEPLETED	(PER SQ.METER)
Residential	S	2.55	4099.	2.1E-07	2.1E-07	1.7E-07	5.8E-10
Residential	SSW	2.01	3234.	2.1E-07	2.1E-07	1.7E-07	8.6E-10
Residential	SW	2.31	3719.	2.6E-07	2.6E-07	2.1E-07	9.3E-10
Residential	W	2.20	3541.	3.4E-07	3.4E-07	2.8E-07	7.9E-10
Residential	WNW	2.24	3597.	3.2E-07	3.2E-07	2.7E-07	6.7E-10
Residential	NW	4.23	6801.	1.7E-07	1.7E-07	1.3E-07	2.8E-10
Residential	NNW	3.51	5656.	2.3E-07	2.2E-07	1.8E-07	4.6E-10
Residential	N	4.51	7264.	1.4E-07	1.4E-07	1.1E-07	2.7E-10
Residential	NNE	3.72	5980.	1.8E-07	1.8E-07	1.4E-07	4.2E-10
Residential	NE	2.14	3436.	3.8E-07	3.8E-07	3.1E-07	1.4E-09
Residential	ENE	1.30	2094.	8.6E-07	8.5E-07	7.4E-07	3.4E-09
Residential	E	1.23	1978.	8.2E-07	8.1E-07	7.0E-07	2.9E-09
Residential	SE	1.68	2703.	9.0E-07	8.9E-07	7.5E-07	1.8E-09
Meat	S	3.98	6403.	1.2E-07	1.1E-07	8.9E-08	2.6E-10
Meat	SSW	3.60	5793.	9.3E-08	9.1E-08	7.2E-08	3.1E-10
Meat	SW	3.70	5955.	1.4E-07	1.3E-07	1.1E-07	4.0E-10
Meat	WSW	4.08	6570.	1.3E-07	1.2E-07	9.7E-08	2.9E-10
Meat	WNW	1.74	2795.	4.6E-07	4.6E-07	3.9E-07	1.0E-09
Meat	NW	4.77	7682.	1.4E-07	1.4E-07	1.1E-07	2.2E-10
Meat	NNW	3.51	5656.	2.3E-07	2.2E-07	1.8E-07	4.6E-10
Meat	N	4.20	6756.	1.6E-07	1.5E-07	1.2E-07	3.0E-10
Meat	NNE	5.79	9313.	1.0E-07	9.9E-08	7.4E-08	1.9E-10
Meat	NE	2.14	3436.	3.8E-07	3.8E-07	3.1E-07	1.4E-09
Meat	SE	4.26	6855.	2.6E-07	2.6E-07	2.0E-07	3.5E-10
Vegetable	S	2.55	4099.	2.1E-07	2.1E-07	1.7E-07	5.8E-10
Vegetable	SSW	2.67	4296.	1.4E-07	1.4E-07	1.1E-07	5.2E-10
Vegetable	SW	2.31	3719.	2.6E-07	2.6E-07	2.1E-07	9.3E-10
Vegetable	W	2.30	3696.	3.2E-07	3.2E-07	2.6E-07	7.4E-10
Vegetable	WNW	2.47	3973.	2.9E-07	2.8E-07	2.3E-07	5.6E-10
Vegetable	NW	4.77	7682.	1.4E-07	1.4E-07	1.1E-07	2.2E-10
Vegetable	NNW	3.51	5656.	2.3E-07	2.2E-07	1.8E-07	4.6E-10
Vegetable	NNE	4.03	6480.	1.6E-07	1.6E-07	1.3E-07	3.6E-10
Vegetable	NE	2.30	3703.	3.4E-07	3.4E-07	2.8E-07	1.2E-09
Vegetable	ENE	1.64	2647.	6.1E-07	6.1E-07	5.2E-07	2.2E-09
Vegetable	E	1.23	1978.	8.2E-07	8.1E-07	7.0E-07	2.9E-09
Vegetable	ESE	4.93	7931.	1.3E-07	1.3E-07	9.6E-08	2.4E-10
Vegetable	SE	1.68	2703.	9.0E-07	8.9E-07	7.5E-07	1.8E-09
Milk	W	4.74	7625.	1.2E-07	1.2E-07	9.2E-08	2.0E-10
EAB	S	.50	805.	2.4E-06	2.4E-06	2.2E-06	9.3E-09
EAB	SSW	.50	805.	1.6E-06	1.6E-06	1.5E-06	9.1E-09
EAB	SW	.50	805.	2.9E-06	2.9E-06	2.3E-06	1.3E-08
EAB	WSW	.50	805.	2.6E-06	2.6E-06	2.4E-06	1.1E-08
EAB	W	.50	805.	3.1E-06	3.1E-06	2.8E-06	9.8E-09
EAB	WNW	.50	805.	3.0E-06	3.0E-06	2.7E-06	8.5E-09
EAB	NW	.50	805.	3.6E-06	3.6E-06	3.3E-06	1.1E-08
EAB	NNW	.50	805.	3.7E-06	3.7E-06	3.4E-06	1.3E-08
EAB	N	.50	805.	3.3E-06	3.2E-06	3.0E-06	1.2E-08
EAB	NNE	.50	805.	3.3E-06	3.3E-06	3.0E-06	1.3E-08
EAB	NE	.50	805.	3.2E-06	3.2E-06	2.9E-06	1.6E-08
EAB	ENE	.50	805.	3.6E-06	3.6E-06	3.3E-06	1.7E-08
EAB	E	.50	805.	3.2E-06	3.2E-06	2.9E-06	1.3E-08
EAB	ESE	.50	805.	3.5E-06	3.5E-06	3.2E-06	1.2E-08
EAB	SE	.50	805.	6.0E-06	6.0E-06	5.5E-06	1.4E-08
EAB	SSE	.50	805.	5.4E-06	5.4E-06	5.0E-06	1.4E-08
Unit 2 to 3	S	.17	274.	1.6E-05	1.6E-05	1.5E-05	4.9E-08
Unit 2 to 3	SSW	.17	274.	1.1E-05	1.1E-05	1.0E-05	4.8E-08
Unit 2 to 3	SW	.17	274.	1.6E-05	1.6E-05	1.5E-05	6.5E-08

Notes:

- a) The term "Dose Evaluation Periphery" means the same as the term "EAB" as input to and output by the XOQDOQ dispersion model. See Subsections 2.7.6.1 and 2.7.5.1 for additional details.
- b) The distances for the Residences, EAB, Meat Animals, Milk Animals and Vegetable Gardens were measured from the edge of the PBA to the receptors. The distance for the Unit 3 Reactor was measured from the center of Unit 2 containment to the center of Unit 3 containment.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-11 Revision: 0

Statement of the Information Needs Item:

Information Needs Item HP-11:

Provide an expert to discuss the assumptions (χ/Q , stability classification, wind directions and speeds based on release and receptor locations) used to analyze transport of releases from Unit 1 during construction of Units 2 and 3, and from Unit 2 during construction of Unit 3.

SCE&G Follow Up Action:

Provide written discussion of the following issue: could a construction worker be closer than the center to center distance assumed (0.17 mile)?

Response:

The center-to-center distance between the reactors of Units 2 and 3 was selected because it represents the average location of a worker over the course of a year as he moves about the construction area. However, it is possible that a construction worker will be located closer than the center-to-center distance for at least some part of the year.

The closest distance that a Unit 3 construction worker would come to the operating Unit 2 is the midpoint between the two reactors, a distance of about 0.09 mile. The atmospheric dispersion factors at this distance compared to the center-to-center distance, as given in ER Table 2.7-16, are as follows:

Location	Direction from Unit 2 to Unit 3	Distance (mi)	X/Q (sec/m ³)			D/Q (m ⁻²)
			No Decay Undepleted	2.26 day Decay Undepleted	8 day Decay Depleted	
Unit 3 Reactor Centerline	S, SW	0.17	1.6E-05	1.6E-05	1.5E-05	6.5E-08
Midpoint between Units 2 and 3	SW	0.09	5.7E-05	5.7E-05	5.5E-05	1.7E-07

ER Table 4.5-1 shows construction worker doses due to liquid and gaseous effluents and direct radiation at the Unit 3 centerline location. As the liquid effluent and direct radiation doses are conservative estimates independent of worker location, they would be unchanged at the midpoint location. The gaseous effluent doses at the midpoint location are 1.7 mrem total body, 2.4 mrem thyroid, 5.4 mrem skin, and 1.8 mrem TEDE.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: HP-11 **Revision:** 0

When these are added to the liquid effluent and direct radiation doses, the resulting total doses at the midpoint location meet the regulatory limits of 10 CFR 20.1301, 10 CFR 50, Appendix I, and 40 CFR 190.

Note: Units 2 and 3 doses reflected in this response are based on 2007 meteorological data.

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: LU-4 Revision: 0

Statement of the Information Needs Item:

Information Needs Item LU-4:

Provide an expert to discuss excavation, trenching, grading, dredging, spoils disposition and excess fill material including the following:

- Volumes of spoils and excess fill expected to accumulate from planned earthwork remaining after construction is completed
- Planned disposition of unused spoils and excess fill material

SCE&G Follow Up Action:

Provide dredging volumes data for intake & discharge, and total spoils volume for the site.

Response:

Intake and Discharge Dredging Volumes

Based upon the conceptual design of the raw water intake structure and outfall discharge diffuser line as described in ER Section 3.4.2, the estimated dredging volumes for the intake and discharge are 10,000 and 11,000 cubic yards, respectively.

Total Spoils Volume

Based upon the current construction plans, the total spoils volume is estimated to be 1,200,000 cubic yards from table top + 1,000,000 cubic yards from power block excavations + 250,000 cubic yards from construction offices, plant access road, railroad corridor, switchyard and other miscellaneous areas = 2,450,000 cubic yards.

All spoils material will be placed in the designated spoils areas permitted under the Phase 2B Storm Water Pollution Prevention Plan.

This estimate is subject to change and will depend upon the grading design for the Phase 3 SWPPP for the table top area, and the power block excavation method.

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

Information Item Number: SE-1 Revision: 0

Statement of the Information Item:

Information Item SE-1:

Provide an expert to discuss the search for environmental justice documentation including:

- Application of guidance discussed in the Commission's decision to grant the ESP permit at the North Anna site, calling for greater detail of analysis in cases where either the low-income or minority population in the impacted area exceeds by more than 20 percent the State or the County minority or low income population or where the minority or low-income population percentage in the impacted area exceeds 50 percent.
- The search for information about any special resource dependencies or practices such as informal pine straw gathering or subsistence fishing.
- Organizations contacted in this regard.

SCE&G Follow Up Action:

Revise ER Section 2.5.4 [enhance subsistence living information, resources, etc. Add more about process and diversity of the area.]

Response:

A new section will be included in the ER that provides the requested information.

COLA Revisions:

See new section 2.5.4.4 below. The new Section 2.5.4.4 will be included in a future ER revision.

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

2.5.4.4 Potential for Disproportionate Impacts

The proposed VCSNS Units 2 and 3 are in a block group with significant Black and Aggregate minority populations. In fact, most of the block groups (13 of 19) in Fairfield County have significant Black or African American minority populations as presented in Table 2.5-26. The majority of the low-income populations; however, are located in Richland County, within the Columbia Metropolitan area. One block group in Fairfield County contains a significant low-income household population, and it is located within the town of Winnsboro.

SCE&G contacted local government officials and the staff of social welfare agencies concerning unusual resource dependencies or practices, such as subsistence living, that could result in potentially disproportionate impacts to minority or low-income populations. Successful interviews were conducted with United Way of the Midlands, Clemson Public Service, the South Carolina Department of Health and Environmental Control (SCDHEC) Region 3 Home Health Services, South Carolina Department of Natural Resources (SCDNR), Newberry County Memorial Hospital, and Newberry County Department of Social Services. Because of the rural nature of the area, most public agencies cover more than one county. Fairfield County-specific agencies could not be located or contacted to discuss minority and low-income populations in the area, but agencies that cover several counties throughout the Midlands were contacted. SCE&G identified no unusual resource dependencies or practices such as subsistence agriculture, hunting, or fishing through which the populations could be disproportionately impacted by the construction or operation of new nuclear reactors.

These interviews support the conclusion that few, if any, subsistence living activities are known to occur near VCSNS. Most agency representatives reported that activities such as hunting, fishing, and gardening were done for recreational purposes, rather than for subsistence. A representative from SCDNR did mention that Vietnamese individuals are occasionally seen collecting *Corbicula* from Monticello Reservoir. However, according to census data (see Section 2.5.4), only one block group with a significant Asian population exists in the 50-mile radius (in Richland County). Since *Corbicula* harvest for possible human consumption has been observed in Lake Monticello, analysis of *Corbicula* has been incorporated into the SCE&G Supplemental Radiological Environmental Monitoring Program. Samples have been collected and analyzed for gamma emitting isotopes and no measureable gamma emitting nuclides have been detected above background (SCE&G 2008).

Agency representatives felt that most low-income individuals relied on government and/or community aid programs rather than fishing, hunting, or gardening. Fishing does take place recreationally in Monticello Reservoir, Parr Reservoir, and the Broad River. The SCDHEC monitors water bodies and publishes fish advisories for water bodies. No advisories exist for Monticello Reservoir, Parr Reservoir, or the Broad River (SCDHEC 2009).

With respect to migrant workers, agency representatives felt that there was not a large migrant worker population in area. No agency representative felt that the small migrant worker population in the area engaged in subsistence fishing, hunting, or gardening.

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item

New references:

SCDHEC (South Carolina Department of Environmental Control) 2009. South Carolina Fish Consumption Advisories 2009. ML-004042. Columbia, South Carolina. March.

SCE&G (South Carolina Electric & Gas) 2008. Radiological Environmental Operating Report – Virgil C. Summer Nuclear Station for the Operating Period January 1, 2007 – December 31, 2007. April.



Thomas D. Gatlin
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803.345.4342

April 23, 2008

Mr. Victor M. McCree
Acting Regional Administrator
USNRC, Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street SW Suite, 23T85
Atlanta, GA 30303-8931

Dear Mr. McCree:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Enclosed is the South Carolina Electric & Gas Company (SCE&G) Annual Radiological Environmental Operating Report as required by Regulatory Guide 4.8 and Section 6.9.1.6 of the Virgil C. Summer Nuclear Station Technical Specifications.

If there are any questions, please contact Ms. Susan B. Reese at (803) 345-4591.

Very truly yours,

Thomas D. Gatlin

SBR/TDG/sr
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RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

VIRGIL C. SUMMER NUCLEAR STATION

FOR THE OPERATING PERIOD

JANUARY 1, 2007 - DECEMBER 31, 2007

April 2008

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EXECUTIVE SUMMARY

This Annual Radiological Environmental Operating Report describes the V.C. Summer Environmental Monitoring Program and the program results for the calendar year 2007.

Included are the identification of sample locations, descriptions of environmental sampling and type of analysis, comparisons of present environmental radioactivity levels and pre-operational environmental data, land use census comparisons of doses calculated from environmental measurements, and a summary of environmental radiological sampling results. Quality assurance practices, sampling deviations and unavailable samples are also discussed.

Sampling activities were conducted as prescribed by the Offsite Dose Calculation Manual (ODCM) for V.C. Summer Nuclear Station (VCSNS) and applicable Health Physics Procedures. Required analyses were performed and detection limits met for required samples with exceptions noted. Samples were collected comprising one thousand three hundred eighteen analyses (1,318) performed to compile the data for the 2007 Environmental Report. Supplemental samples comprising one hundred seventy four (174) analyses were performed on some media for additional information. Based on the results from the annual land use census, the current number of sampling sites for V.C. Summer Nuclear Station is sufficient.

Concentrations observed in the environment in 2007 from V.C. Summer related radionuclide concentrations were within the range of concentrations observed in the past. Review of the data indicated that very low radioactive concentration in groundwater and drinking water were the only indicators with VCSNS produced radioactivity. These activities were well below the reporting level requirements of the ODCM. It is therefore concluded that VCSNS operations have no significant radiological impact on the health and safety of the public or the environment.

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INTRODUCTION

Virgil C. Summer Nuclear Station (VCSNS) utilizes a pressurized water reactor rated at 2900 MWt (990 MWe gross). The station is located adjacent to the Monticello Reservoir near Jenkinsville, South Carolina and approximately 26 miles northwest of Columbia. VCSNS achieved initial criticality on October 22, 1982, reached 50% power December 12, 1982 and 100% power June 10, 1983 following steam generator feedwater modifications. Steam generators were replaced in the fall of 1994. During the ninth refuel the plant was updated to 2900 MWt (990 MWe gross). VCSNS is currently operating in the 16th fuel cycle.

VCSNS is operating in conjunction with the adjacent Fairfield Pump Storage Facility (FPSF) which consists of eight reversible pump-turbine units of 60 MWe capacity each. During periods of off-peak power demand, base load generating capacity is used to pump water from Parr Reservoir to Monticello Reservoir. Monticello Reservoir has a surface area of approximately 6800 acres and lies about 150 feet above Parr Reservoir whose full pool area is approximately 4400 acres. The pump-turbine units operate in the generating mode to meet peak system loads while Monticello Reservoir also provides condenser cooling water for VCSNS. Cooling water intake and discharge structures are separated by a jetty to ensure adequate circulation within the reservoir.

VCSNS is located in Fairfield County which, along with Newberry County, makes up the principle area within a 10 mile radius of the plant. This area is mainly forest with only about 30% devoted to small farming activities principally producing small grains, feed crops and beef cattle. Significant portions of Lexington and Richland Counties are encompassed within the 20-mile radius of the plant and exhibit similar agricultural activities. Columbia, the state capital, is the only large city within the 50-mile radius of the plant. Small agricultural concerns are predominant, but make up less than 50% of the land area. The main industrial activity is concentrated around Columbia and is generally greater than 20 miles from the VCSNS.

Liquid effluents from VCSNS are released into the Monticello/Parr Reservoirs at two discharge points: the Circulating Water Discharge Canal (CWDC) and the FPSF Penstocks. Non-nuclear drains are released to the CWDC. Effluent from the liquid waste processing system and processed steam generator blowdown are released through the penstocks. Radioactive gaseous effluents from VCSNS are released from three points: the Main Plant Vent, the Reactor Building Purge Exhaust and the Oil Incineration Facility, all considered to be ground level releases.

Radioactive liquid and gaseous releases from the facility and their potential influence on the surrounding biota and man are the primary concern of the Radiological Environmental Monitoring Program at VCSNS. This report summarizes the results of the Radiological Environmental Monitoring Program conducted during 2007. Data trends, control/indicator and preoperational/operational data intercomparisons and other data interpretations are presented.

DESCRIPTION OF THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The Radiological Environmental Monitoring Program is carried out in its entirety by South Carolina Electric and Gas Company. The program has been designed to meet the following general commitments:

1. To analyze selected samples in important anticipated pathways for the qualification and quantification of radionuclides released to the environment surrounding VCSNS.
2. To establish correlations between levels of environmental radioactivity and radioactive effluents from VCSNS operation.

The program utilizes the concepts of control/indicator and preoperational /operational intercomparisons in order to establish the adequacy of radioactivity source control and to realistically verify the assessment of environmental radioactivity levels and subsequent radiation dose to man.

Sample media and analysis sensitivity requirements have been established to ensure that the maximum dose pathways are monitored and sensitivities represent a small fraction of annual release limits. Effluent dispersion characteristics, demography, hydrology and land use have been considered in selection of environmental sampling locations. These criteria were used to establish both the preoperational and operational phases of the Radiological Environmental Monitoring Program. Elements of the program monitor the impact of gaseous and liquid effluents released from VCSNS.

Specific methods used in monitoring the pathways of these effluents which may lead to radiation exposure of the public, based on existing demography, are summarized below in Table 1. Requirements of the Radiological Environmental Monitoring Program are specified in the VCSNS Offsite Dose Calculation Manual (ODCM). Elements of the program monitor the impact of gaseous and liquid effluents released from VCSNS.

Table 1 - Monitoring Methods for Critical Radiation Exposure Pathways

Effluent Release Type	Exposure Pathway	Monitoring Media
Gaseous	Immersion Dose and other External Dose Vegetation (Ingestion) Milk (Ingestion)	Thermoluminescent Dosimetry (TLD), Area Monitoring, Air Sampling Vegetation and Food Crop Sampling, Milk Sampling, Grass (Forage) Sampling
Liquid	Fish (Ingestion) Water & Shoreline Exposure (Ingestion and Immersion) Drinking Water (Ingestion)	Fish Sampling Surface Water Sampling, Ground Water Sampling, Shoreline and Bottom Sediment Sampling Drinking Water Sampling

Monitoring sites indicative of plant operating conditions are generally located within a 5-mile radius of the plant. Table 6 provides a list of ODCM required sampling locations. Table 7 provides a list of supplemental sampling locations. Maps showing radiological environmental sampling locations within a radius of approximately 5 miles from VCSNS are presented as Figures 1-2 and 1-5. Figure 1-1 shows monitoring sites at distances greater than 10 miles from the plant. These locations indicate regional fluctuations in background radiation levels.

In addition to preoperational/operational data intercomparisons, control/indicator data intercomparisons are utilized. This is done to assess the probability that any observed abnormal measurement of radioactivity concentration is due to random or regional fluctuations rather than to a true increase in local environmental radioactivity concentration.

Environmental data is gathered through multiple types of sampling and measurements at specific locations. Several multiple sampling combinations are in use around the VCSNS. For example, all air sampling locations serve as environmental dosimetry monitoring locations. At these locations, airborne plant effluents are monitored for gamma immersion dose (noble gases), in addition to air contaminants. Monitoring locations Site 6 (1.0 mi. ESE) and Site 7 (1.0 mi. E) have broadleaf vegetation gardens for monitoring gaseous effluent deposition (ingestion pathway) in the two sectors having the highest deposition coefficients (D/Q) with real potential for exposure. Monitoring location Site 18 (16.5 mi. S) serves as a control location for direct radiation and garden monitoring.

Liquid effluents are monitored using three different monitoring media (fish, bottom sediment and surface water) at the two most probable affected bodies of water around the plant: Site 21, Parr Reservoir (2.7 mi. SSW) and Site 23, Monticello Reservoir (0.5 mi. ESE). The control location for liquid effluent comparisons is at Site 22, Neal Shoals (26.0 mi. NNW) on the Broad River.

Quality of analytical measurements is demonstrated by participation in a laboratory intercomparison program. Results of the intercomparison program with an outside vendor and VCSNS Count Room were satisfactory in 2007. The results of each of these quality control checks of the Radiological Environmental Monitoring program verify the technical credibility of analytical data generated and reported by the program.

LAND USE CENSUS

Annually a land use census is performed within a 5-mile radius of VCSNS to verify the adequacy of sample locations. In addition, the location of the maximum exposed individual (MEI) is identified. The results of the land use census performed in 2007 are included in Table 4. A verification of the maximum exposed individual location is presented in Table 5. Identification of the highest offsite dose locations was performed by calculating a hypothetical dose based on predicted VCSNS source term from the Operating License Environmental Report and 2007 meteorological data. Exposure pathways used in the analysis were those identified during the land use census.

The location and pathway presently used in the ODCM for offsite organ dose calculations (E 1.1 miles - residence/garden) was found to have a calculated dose of 3.23E+0 mrem/yr. In addition, the ODCM required environmental gardens (ESE 1.0 and E 1.0 mile) were found to have a calculated dose of 2.23E+0 and 4.28E+0 mrem/year. There were no milking animals or dairy activity found within 5 kilometers of VCSNS. Therefore, changes to the ODCM gaseous effluent calculations or garden sample locations are not indicated.

MONITORING RESULTS AND DISCUSSION

The results of the Radiological Environmental Monitoring Program for 2007 are summarized in Table 8. For comparison, preoperational data are summarized in Table 9. The Radiological Environmental Program attained a program compliance rate of approximately 99.3%. A listing of program exceptions and their respective causes are included in Table 11. Analysis of the impact of these omissions verified that program quality has not been affected.

Corbicula harvest for possible human consumption was observed in Lake Monticello in 2005. Since that time Corbicula analysis has been incorporated in the Supplemental Sampling Program. Samples were collected and analyzed for gamma emitting isotopes. No measurable gamma emitting nuclides were detected above background.

Gross beta activities measured in air particulate samples collected at indicator locations around VCSNS were consistent with preoperational levels and not statistically different from control locations. The highest site-specific mean activity ($2.41\text{E-}2$ pCi/m³) was measured at indicator location Site 7 (Lab Garden 1.0 mi. E). The results indicate that the operation of VCSNS has not contributed to detectable increases of airborne gross beta activity in the environment.

Gamma spectroscopy measurements of composited air particulate samples and activated charcoal cartridges support the gross beta activity trend. Only natural background activities were detected. The highest minimum detectable activity (MDA) levels for ¹³⁴Cs, ¹³⁷Cs and ¹³¹I were $2.09\text{E-}3$, $2.09\text{E-}3$ and $2.03\text{E-}2$ pCi/m³, respectively. The average maximum results support the gaseous effluent release data reported in the 2007 Annual Effluent and Waste Disposal Reports for VCSNS. No measurable iodine or particulate were released. 100% of the required indicator/control air samples were collected.

Environmental dosimetry measurements did not differ significantly from preoperational measurements. Indicator and control dosimetry measurements also showed no appreciable differences. Comparison with other operational years shows no statistically significant difference. Monitoring location 4 (Fairfield Hydro 1.2 mi. WNW), was the indicator location showing the highest mean exposure rate of $1.17\text{E+}1$ μR/hr. This is similar to the 2006 value of $1.22\text{E+}1$ μR/hr and consistent with the highest mean exposure rate of $1.4\text{E+}1$ μR/hr measured during the preoperational period. 98.1% of the required TLDs were collected.

Gamma spectroscopy measurements of surface water samples did not indicate the presence of activated corrosion or fission products above the respective MDA's for indicator sites. 97.2% of indicator/control surface water samples were collected.

Gamma spectroscopy measurements of the ODCM required ground water samples did not indicate the presence of activated corrosion or fission products above the respective MDAs. Tritium analysis indicated the presence of tritium above MDA in three indicator samples. All three of these samples were collected from site 112 (0.36 mi. SSE onsite adjacent to plant holding ponds). The tritium concentrations at site 112 were $5.45\text{E}+2$, $5.95\text{E}+2$, and $9.53\text{E}+2$ pCi/l. All required indicator/control ground water samples were collected.

Gamma spectroscopy measurements of drinking water samples collected from the Jenkinsville water supply did not indicate the presence of activated corrosion or fission product activity above the respective MDAs. Gamma spectroscopy analysis indicated the presence of ^{131}I slightly above MDA in 1 indicator sample. Site 17 (Columbia Water Works 25.0 mi. SE) had an ^{131}I concentration of $5.41\text{E}-1$ pCi/l. The highest MDA for ^{131}I at all indicator and control sites was $4.20\text{E}-1$ pCi/l. The highest indicator and control site-specific gross beta activity was measured at Site 28 (Nuclear Training Center 2.6 mi. SSE) at a level of $4.65\text{E}+0$ pCi/l. 97.2% of indicator/control drinking water samples were collected.

There were no milk samples collected in 2007. Milk sampling is required to be performed at the three highest dose locations within 5 kilometers of the plant or at 5 to 8 kilometers of the plant, if doses are calculated to be greater than 1 mrem per year. Presently there are no locations meeting this criteria for indicator dairies. The closest dairy is approximately 8 kilometers from the plant (see Table 4). Milk samples will be obtained from this dairy if gaseous releases from the plant exceed 5% of quarterly organ dose limits or radionuclides (attributed to the operation of VCSNS) are detected in broadleaf vegetation, grass or air samples at concentrations greater than required LLDs.

Gamma spectroscopy measurement of supplemental grass samples collected indicated ^{137}Cs in 11 of 12 samples at Site 2 (transmission line 1.1 mi. SW) at concentrations ranging from $2.26\text{E}+1$ to $2.59\text{E}+2$ pCi/kg. The maximum preoperational control activity was $3.4\text{E}+2$ pCi/kg. A review of Site 2 air sample results indicated that no ^{137}Cs was detected. 97.2% of indicator/control grass samples were collected.

Gamma spectroscopy measurements of the broadleaf samples collected did not indicate the presence of activated corrosion or fission products above the respective MDAs. All of the required indicator/control broadleaf samples were collected.

Gamma spectroscopy measurements of all non-leafy (other vegetation) supplemental samples collected did not indicate the presence of activated corrosion or fission products above the respective MDA. All required indicator/control non-leafy (other vegetation) samples were collected.

Gamma spectroscopy measurements of the fish samples collected at indicator and control sites indicated the presence of ^{137}Cs in 2 samples. Indicator site 23 (Monticello Res. 0.5 mi. ESE) had a ^{137}Cs concentration of $1.31\text{E}+1$ pCi/kg. And control site 22 (Neal Shoals Reservoir, 26.0 mi. NNW) had a ^{137}Cs concentration of $1.57\text{E}+1$ pCi/kg. These activities are below the preoperational mean of $2.8\text{E}+1$ pCi/kg and well below the preoperational max of $1.00\text{E}+2$ pCi/kg for fish samples. All required indicator/control fish samples were collected.

Gamma spectroscopy measurements of sediment samples indicated the detection of ^{137}Cs in 3 of 4 indicator samples taken. At Site 21 (Parr Res. 2.7 mi. SSW) at concentrations of $4.52\text{E}+1$ and $7.26\text{E}+1$ pCi/kg, and Site 23 (Monticello Res. 0.5 mi. ESE) at a concentration of $8.75\text{E}+1$ pCi/kg. ^{137}Cs was detected in 2 of 2 control samples taken at Site 22 (Neal Shoals 26 mi. NNW) at concentrations of $9.15\text{E}+0$ and $6.14\text{E}+1$ pCi/kg. All required indicator/control sediment samples were collected.

Radiation doses to man, corresponding to the concentrations of activity in sediment were not calculated. ^{137}Cs was the only activity identified at concentrations below the preoperational levels.

Table 2 - 2007 Fission and Activated Corrosion Product Activity in Sediment

Location	Radionuclide	Activity (pCi/kg)	
		Maximum	Mean
Monticello Reservoir	^{137}Cs	$8.75\text{E}+1$	$8.75\text{E}+1$
Parr Reservoir	^{137}Cs	$7.26\text{E}+1$	$5.89\text{E}+1$
Neal Shoals	^{137}Cs	$6.14\text{E}+1$	$3.53\text{E}+1$

CONCLUSION

As in previous years of VCSNS operation, the presence of fission product activity attributed to residual fallout from atmospheric weapons testing and the Chernobyl accident were detected in environmental media including sediment, fish, and grass

No detectable fission or activation product activity attributed to VCSNS operations was observed in environmental media except for tritium in ground water at site 112 (0.36 mi. SSE, onsite adjacent to plant holding ponds) which was well below the EPA drinking water standard. Drinking water from Columbia Water Works contained ^{131}I at a concentration of $5.41\text{E-}1\text{pCi/l}$; this is below the required LLD for drinking water, and below the concentrations identified on several occasions at our surface water control site upstream of the drinking water intake. The dose from this activity represents a small fraction of VCSNS effluent dose limits. The absence of an impact was expected since, historically, releases from VCSNS have been a small fraction of ODCM Specification limits. The dose calculated for the maximally exposed individual will not result in observable effect on the ecosystem or general public. The results of the Radiological Environmental Monitoring Program, therefore, substantiate the continuing adequacy of source control at VCSNS and conformance of station operation to 10 CFR 50, Appendix I design objectives.

Table 3 - Required Sampling Site Locations

Site No.	Description	Distance¹ (Miles)	Direction²	Sample Type(s)³
1	Borrow Pit	1.2	179.8 S	DQ
2	Transmission Line	1.1	225.0 SW	AP, RI, DQ
3	Firing Range	1.2	270.0 W	DQ
4	Fairfield Hydro	1.2	289.5 WNW	DQ
5	Transmission Line Entrance	0.9	144.0 SE	DQ
6	Environmental Lab Garden	1.0	111.0 ESE	AP,RI,GA,DQ,GW
7	Environmental Lab Garden	1.0	97.8 E	AP,RI,DQ, GA
8	Monticello Res. S of Rd 224	1.5	62.0 ENE	DQ
9	Ball Park	2.3	41.6 NE	DQ
10	Meteorological Tower #2	2.5	25.5 NNE	DQ
12	Old Hwy 99	4.2	349.4N	DQ
13	North Dam	2.9	333.0 NNW	DQ
14	Dairy (Shealy) ⁴	6.5	277.0 W	MK,GR
16	Dairy (Parr) ⁴	20.0	275.5 W	MK,GR
16a	TLD Location	28.0	278.6W	DQ
17	Columbia Water Works	25.0	144.0 SE	AP,RI,DQ,DW
18	Residence/Pine Island Club ⁵	16.5	165.0 S	DQ,GA
19	Residence/Little Saluda	21.0	224.0 SSW	DQ
20	Residence/Whitmire	22.0	309.5 NW	DQ
21	Parr Reservoir	2.7	199.5 SSW	SW,FH,BS
22	Neal Shoals	26.0	343.1 NNW	SW,FH,BS
23	Discharge Canal (Mont, Res.)	0.5	104.5 ESE	SW,FH,BS
26	On Site Well (P2)	460 Ft	270.0 W	GW
27	On Site Well (P5)	510 Ft	180.0 S	GW
28	Nuclear Training Center (EOF) ⁶	2.6	170.2 SSE	DW
29	Trans. Line WSW of VCSNS	1.0	260.6 WSW	DQ
30	Oak Tree North of Borrow Pit ⁷	1.0 / 0.5	196.2 SSW	DQ, AP, RI
31	McCrorey-Liston School	6.6	11.5 NNE	DQ
32	Clark Bridge Road and Brooks Drive	4.6	24.0 NNE	DQ
33	Rd 48 near Hwy 213	4.2	68.0 ENE	DQ
34	Rd 419 North of Hwy 60	4.9	111.0 ESE	DQ
35	Glenn's Bridge Road	4.6	132.0 SE	DQ
36	Woods Behind Jenk. Post Office	3.1	151.0 SSE	DQ
37	Residence	4.9	304.8 NW	DQ
39	LMWTF	14.0	168.0 SSE	DW

Site No.	Description	Distance ¹ (Miles)	Direction ²	Sample Type(s) ³
41	Below Catwalk at Trestle	3.8	182.0 S	DQ
42	Broad River Rd (Residence Peak)	3.8	198.0 SSW	DQ
43	Hwy 176 and Rd 435	5.2	236.0 SW	DQ
44	Rd 28 at Cannon's Creek	2.8	256.6 WSW	DQ
45	Rd 33 at Pomaria	5.8	253.2 WSW	DQ
46	Rd 28 at Heller's Creek	3.7	291.5 WNW	DQ
47	Fairfield Tailrace	1.0	316.0 NW	DQ
52	Monticello (Rd 11)	3.8	13.0 NNE	DQ
53	Rd 359	3.0	46.5 NE	DQ
54	Jenkinsville School	1.7	72.5 ENE	DQ
55	St. Barnabas Church	2.8	91.5 E	DQ
56	Old Jenkinsville Dinner	2.0	144.0 SE	DQ
58	Residence	2.5	157.0 SSE	DQ
59	Nuclear Training Center (EOF) ⁶	2.6	170.2 SSE	DQ, GW
60	Rd 98 near Rd 28	3.5	274.6 W	DQ
100	Remediation Well (B-1)	450 Ft	NW	GW
101	Remediation Well (B-2)	300 Ft	NNW	GW
102	Remediation Well (B-6)	400 Ft	NE	GW
103	Remediation Well (B-7)	80 Ft	NE	GW
104	Remediation Well (B-9)	175 Ft	NE	GW
105	Remediation Well (B-12)	100 Ft	ESE	GW
106	Remediation Well (B-14)	250 Ft	SE	GW
107	Remediation Well (B-28)	400 Ft	SW	GW
108	Remediation Well (B-33)	250 Ft	W	GW
109	Remediation Well (B-35)	450 Ft	NW	GW
110	Remediation Well (B-36)	300 Ft	NW	GW
111	NPDES Well (GW-8)	0.27	320 SE	GW
112	NPDES Well (GW-9)	0.36	331 SSE	GW
113	NPDES Well (GW-12)	0.33	332 SSE	GW
114	NPDES Well (GW-13A)	0.39	317 SE	GW
115	NPDES Well (GW-15)	0.39	330 SSE	GW

Footnotes

1. Distance given is the distance between the site location and the VCSNS reactor containment building.
2. Direction given in degrees from true north-south line through center of reactor containment building.
3. Sample Types:

AP = Air Particulate	GW = Ground Water	GA = Garden
RI = Air Radioiodine	DW = Drinking Water	FH = Fish
DQ = Quarterly TLD	MK = Milk	BS = Bottom Sediment
SW = Surface Water	GR = Grass (Forage)	
4. Site 14 and 16 are not presently in use. If conditions change, requiring a renewal of dairy sampling these sites will be reactivated.
5. Site 18 consists of 2 locations in close proximity to Lake Murray. Garden product samples are taken at the Wyse residence. The TLD is located on Pine Island.
6. Site 28 for drinking water and site 59 for quarterly TLD measurements are co-located at the location of the SCE&G Nuclear Training Center which also serves as the Virgil C. Summer Station Emergency Offsite Facility.
7. Site 30 consists of two locations in the same sector. The air sampler is located 0.5 miles from the reactor to support construction of a new facility. The TLD is located at the site boundary in the same sector.

Table 4 - Results of the 2007 Land Use Census Verification

Sector	Nearest Residence	Miles	Nearest Garden	Miles	Nearest Cattle	No. Milked	Miles	Nearest Goat	No. Milked	Miles
N	P. Oliver	3.73			John Robinson	0	3.4			
NNE	Thomas K. Crumblin (A)	2.9	Virgil Harrison	3.21	Wi/Charles Coleman	0	4.97			
NE	Gregrey Guinyard Jr. (A)	1.55	David Stone	2.1	David Stone	0	2.1			
ENE	Robert Martin	1.53	Essie Mae Glenn	1.68				Robert Martin	0	1.53
E	Lynn Mincy	1.2	Lynn Mincy	1.2						
ESE	Carrie Lee Martin	1.1								
SE	Mary White	1.44	Mary White	1.44	Sim Robertson	0	4.7			
SSE	Ronnie Mann	2.39	Ronnie Mann	2.39						
S	Kelly Boulware	3.56	Kelly Boulware	3.56	Shirley Counts	0	5			
SSW	Nick Bates	3.11	Nora Wicker	3.77	G.A. Mayers	0	4.7			
SW	Marvin Miller	3.3	Marvin Miller	3.3				Shakkori	0	4.7
WSW	Ron Hope	2.9	Mary Davis	3	Ken/Virg Graham	0	4.98	Steve All	*	4.83
W	Jerry Cassado	2.55	Marion Livingston	2.8	Marion Livingston	0	2			
W					Ken/Virg Graham	90	5			
WNW	Randy Wedaman (A)	4.24	Ronnie Leitzey	4.72	Ronnie Leitzey	1	4.15	Ronnie Leitzey	15	4.15
NW	Louise Workman	3.9								
NNW	Frank March	2.9	Frank March	2.9	Frank March	0	2.9			

(A) Change In Closest Residence

(*) Unknown

Table 5 Critical Receptor Evaluation for 2007

NAME	SECTOR	MILES	PATHWAY	X/Q	D/Q	DOSE* mRem/y
John Robinson	N	3.4	B	2.7E-07	7.3E-10	7.32E-02
P. Oliver	N	3.73	Res	2.2E-07	5.9E-10	8.18E-03
Thomas K. Crumblin	NNE	2.9	Res	4.1E-07	1.3E-09	1.53E-02
Virgil Harrison	NNE	3.21	Res, Gar	3.3E-07	1.0E-09	2.74E-01
Will/Charles Coleman	NNE	4.97	B	1.4E-07	3.9E-10	3.91E-02
Gregrey Guinyard Jr.	NE	1.55	Res	1.9E-06	6.3E-09	7.13E-02
David Stone	NE	2.1	Res, Gar, B	9.6E-07	3.0E-09	1.12E+00
Robert Martin	ENE	1.53	Res, G	2.1E-06	6.8E-09	1.60E-01
Essie Mae Glenn	ENE	1.68	Res, Gar	1.7E-06	5.4E-09	1.47E+00
Garden-7 **	E	1	Res, Gar	4.3E-06	1.6E-08	4.28E+00
Lynn Mincey ¹	E	1.2	Res, Gar	2.8E-06	9.8E-09	2.64E+00
Garden-6 **	ESE	1	Res, Gar	2.3E-06	8.3E-09	2.23E+00
Carrie Lee Martin	ESE	1.1	Res	1.9E-06	6.5E-09	7.14E-02
Mary White	SE	1.44	Res, Gar	6.0E-07	2.8E-09	7.33E-01
Sim Robertson	SE	4.7	Res, B	4.9E-08	1.8E-10	1.98E-02
Ronnie Mann	SSE	2.39	Res, Gar	1.3E-07	7.6E-10	1.96E-01
Kelly Boulware	S	3.56	Res, Gar	7.8E-08	5.0E-10	1.28E-01
Shirley Counts	S	5	Res, Gar, B	3.9E-08	2.4E-10	8.54E-02
Nick Bates	SSW	3.11	Res	1.2E-07	8.6E-10	4.73E-03
Nora Wicker	SSW	3.77	Res, Gar	7.8E-08	5.5E-10	1.40E-01
G.A. Mayers	SSW	4.7	Res, Gar, B	4.9E-08	3.4E-10	3.57E-02
Marvin Miller	SW	3.3	Res, Gar	8.9E-08	8.9E-10	2.23E-01
Shakkori	SW	4.7	Res, G	4.2E-08	4.0E-10	6.47E-03
Ron Hope	WSW	2.9	Res	1.0E-07	8.7E-10	4.02E-03
Mary Davis	WSW	3	Res, Gar	9.3E-08	8.1E-10	2.04E-01
Steve All	WSW	4.83	Res, G, M	3.4E-08	2.8E-10	2.52E-01
Ken/Virg Graham	WSW	4.98	B	3.2E-08	2.6E-10	2.84E-02
Jerry Cassado	W	2.55	Res	1.1E-07	6.7E-10	4.28E-03
Marion Livingston	W	2	B	1.8E-07	1.2E-09	1.19E-01
Marion Livingston	W	2.8	Res, Gar	8.6E-08	5.4E-10	1.38E-01
Marion Livingston	W	2 & 2.8	Res, Gar, B	Both	Both	2.57E-01
Ken/Virg Graham	W	5	Res, Gar, B, M	2.6E-08	1.5E-10	2.84E-02
Randy Wedaman	WNW	4.24	Res	3.9E-08	1.6E-10	1.48E-03
Ronnie Leitzsey	WNW	4.15	M, B, G	4.1E-08	1.7E-10	1.69E-01
Ronnie Leitzsey	WNW	4.72	Res, Gar	3.2E-08	1.3E-10	3.45E-02
Ronnie Leitzsey	WNW		Res, Gar, M, B, G	Both	Both	2.04E-01
Louise Workman	NW	3.9	Res	6.7E-08	2.7E-10	2.54E-03
Frank March	NNW	2.9	Res, Gar, B	2.8E-07	8.8E-10	3.28E-01
ODCM ORGAN DOSE	E	1.1	Res, Gar	3.4E-06	1.2E-08	3.23E+00

Pathway

Res = Residence

B = Beef

G = Goat

Gar = Garden

M = Milk(Infant)

Footnotes:

¹ Maximum exposed individual.

* Hypothetical dose based on Operating License Environmental Report Source Term.

X/Q and D/Q were derived from 2007 data

** ODCM required environmental gardens.

*** Evaluated conservatively

Table 6 – Radiological Environmental Monitoring Program Specifications

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
AIRBORNE: I. Particulate	A) 3 Indicator samples to be taken at locations (in different sectors) beyond but as close to the exclusion boundary as practicable where the highest offsite sector ground level concentrations are anticipated. ²	Continuous sampler operation with weekly collection.	2 7 30	Gross beta following filter change; Quarterly composite (by location) for gamma isotopic.
	B) 1 Indicator sample to be taken in the sector beyond but as close to the exclusion boundary as practicable corresponding to the residence having the highest anticipated offsite ground level concentration or dose. ²	Continuous sampler operation with weekly collection.	6	Gross beta following filter change; Quarterly composite (by location) for gamma isotopic.
	C) 1 Indicator sample to be taken at the location of one of the dairies being sampled meeting the criteria of VII(A). ^{2,4}	Continuous sampler operation with weekly collection.	N/A	Gross beta following filter change; Quarterly composite (by location) for gamma isotopic.
	D) 1 Control sample to be taken at a location at least 10 air miles from the site and not in the most prevalent wind directions. ²	Continuous sampler operation with weekly collection.	17	Gross beta following filter change; Quarterly composite (by location) for gamma isotopic.
II. Radiiodine	A) 3 Indicator samples to be taken at two locations as given in I(A) above	Continuous sampler operation with weekly canister collection.	2 7 30	Gamma isotopic for Iodine 131 weekly.
	B) 1 Indicator sample to be taken at the location as given in I(B) above.	Continuous sampler operation with weekly canister collection.	6	Gamma isotopic for Iodine 131 weekly.
	C) 1 Indicator sample to be taken at the location as given in I(C) above.	Continuous sampler operation with weekly canister collection.	N/A	Gamma isotopic for Iodine 131 weekly.
	D) 1 Control sample to be taken at a location similar in nature to I(D) above.	Continuous sampler operation with weekly canister collection.	17	Gamma isotopic for Iodine 131 weekly.

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
III. Direct	<p>A) 13 Indicator stations to form and inner ring of stations in the 13 accessible sectors within 1 to 2 miles of the plant.</p> <p>B) 16 indicator stations to form an outer ring of stations in the 16 accessible sectors within 3 to 5 miles of the plant.</p> <p>C) 11 Stations to be placed in special interest areas such as population centers, nearby residences, schools and in 4 or 5 areas to serve as controls.</p>	<p>Monthly or quarterly exchange^{5,7} two or more dosimeters at each location.</p> <p>Monthly or quarterly exchange^{5,7} two or more dosimeters at each location.</p> <p>Quarterly exchange⁷; two or more dosimeters at each location</p>	<p>1,2,3,4,5,6,7,8,9,10,29,30,47</p> <p>12,13,32,33,34,35,36,37,41,42,43,44,46,53,55,60</p> <p>16,17,18,19,20,31,45,52,54,56,58</p>	<p>Gamma dose monthly or quarterly</p> <p>Gamma dose monthly or quarterly</p> <p>Gamma dose quarterly.</p>
WATERBORNE IV. Surface Water	<p>A) 1 Indicator sample downstream to be taken at a location which allows for mixing a dilution in the ultimate receiving river.</p> <p>B) 1 Control sample to be taken at a location on the receiving river sufficiently far upstream such that no effects of pumped storage operation are anticipated.</p> <p>C) 1 Indicator sample to be taken in the upper reservoir of the pumped storage facility at the plant discharge canal.</p>	<p>Time composite samples⁶ with collection every month⁵</p> <p>Time composite samples⁶ with collection every month⁵</p> <p>Time composite samples⁶ with collection every month⁵</p>	<p>21³</p> <p>22³</p> <p>23³</p>	<p>Gamma isotopic monthly with quarterly composite (by location) to be analyzed for tritium⁷</p> <p>Gamma isotopic monthly with quarterly composite (by location) to be analyzed for tritium⁷.</p> <p>Gamma isotopic monthly with quarterly composite (by location) to be analyzed for tritium⁷.</p>
V. Ground Water	<p>A) 19 Indicator samples to be taken within the exclusion boundary and in the direction of potentially affected ground water supplies.</p> <p>B) 1 Control sample from unaffected location</p>	<p>Quarterly grab sampling⁷</p> <p>Quarterly grab sampling⁷</p>	<p>6, 26, 27, 100-115</p> <p>59</p>	<p>Gamma isotopic and tritium analyses quarterly⁷.</p> <p>Gamma isotopic and tritium analyses quarterly⁷.</p>

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
VI. Drinking Water	A) 1 Indicator sample from a nearby public ground water supply source.	Monthly grab sampling ⁵ .	28	Monthly ⁵ gamma isotopic, gross beta and quarterly ⁷ composite for tritium analyses.
	B) 1 Indicator (finished water) sample from the nearest downstream water supply.	Monthly composite sampling.	17	Monthly ⁵ gamma isotopic, and gross beta and quarterly ⁷ composite for tritium analyses.
	C) 1 Control (finished water) sample from an unaffected water supply.	Monthly composite sampling.	39	Monthly ⁵ gamma isotopic, and gross beta and quarterly ⁷ composite for tritium analyses
INGESTION: VII. Milk ⁴	A) Samples from milking animals in 3 locations within 5 km having the highest dose potential. If there are none then 1 sample from milking animals in each of 3 areas between 5 to 8 km distance where doses are calculated to be greater than 1 mrem per year. ¹⁰	Semimonthly when animals are on pasture ⁸ , monthly other times ⁵	To be supplied when milk animals are found in accordance with criteria VII.A.	Gamma isotopic and I-131 analysis semimonthly ⁸ when animals are on pasture, monthly other times ⁵
	B) 1 Control sample to be taken at the location of a dairy > 20 miles distance and not in the most prevalent wind direction ² .	Semimonthly when animals are on pasture ⁸ , monthly other times ^{5,11}	16	Gamma isotopic and I-131 analysis semimonthly ⁸ when animals are on pasture, monthly other times ⁵
	C) 1 Indicator grass (forage) sample to be taken at the location of one of the dairies being sampled meeting the criteria of VII(A), above, when animals are on pasture	Monthly when available ⁵	To be supplied when milk animals are found in accordance with criteria VII.A.	Gamma isotopic.
	D) 1 Control grass (forage) sample to be taken at the location of VII(B) above.	Monthly when available ^{5,11}	16	Gamma isotopic.

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
VIII. Food Products	A) 2 Samples of broadleaf vegetation grown in the 2 nearest offsite location of highest calculated annual average ground level D/Q if milk sampling is not performed within 3 km or if milk sampling is not performed at a location within 5-8 km where the doses are calculated to be greater than 1 mrem/yr ¹⁰ .	Monthly when available ⁵ .	6 7	Gamma isotopic on edible portion.
	B) 1 Control sample for the same foods taken at least 10 miles distance and not in the most prevalent wind direction if milk sampling is not performed within 3 km or if milk sampling is not performed at a location within 5 to 8 km where the doses are calculated to be greater than 1 mrem/yr ¹⁰ .	Monthly when available ⁵ .	18	Gamma isotopic on edible portion.
IX. Fish	A) 1 Indicator sample to be taken at a location in the upper reservoir.	Semiannual ⁹ collection of the following specie types if available: bass; bream, crappie; catfish, carp.	23 ³	Gamma isotopic on edible portions semiannually ⁹ .
	B) 1 Indicator sample to be taken at a location in the lower reservoir.	Semiannual ⁹ collection of the following specie types if available: bass; bream, crappie; catfish, carp.	21 ³	Gamma isotopic on edible portions semiannually ⁹ .
	C) 1 Control sample to be taken at a location on the receiving river sufficiently far upstream such that no effects of pumped storage operation are anticipated	Semiannual ⁹ collection of the following specie types if available: bass; bream, crappie; catfish, carp.	22 ³	Gamma isotopic on edible portions semiannually ⁹ .
AQUATIC: X. Sediment	A) 1 Indicator sample to be taken at a location in the upper reservoir.	Semiannual grab sample. ⁹	23 ³	Gamma isotopic.
	B) 1 Indicator sample to be taken on or near the shoreline of the lower reservoir.	Semiannual grab sample. ⁹	21 ³	Gamma isotopic.
	C) 1 Control sample to be taken at a location on the receiving river sufficiently far upstream such that no effects of pumped storage operation are anticipated.	Semiannual grab sample. ⁹	22 ³	Gamma isotopic.

FOOTNOTES

1. Reserved for future use.
2. Sample site locations are based on 5-year average meteorological analysis.
3. Though generalized areas are noted for simplicity of sample site enumeration, airborne, water and sediment sampling is done at the same location whereas biological sampling sites are generalized areas in order to reasonably assure availability of samples.
4. Milking animal and garden survey results will be analyzed annually. If the survey should indicate new dairying activity the owners shall be contacted with regard to a contract for supplying sufficient samples. If contractual arrangements can be made, site(s) will be added for additional milk sampling up to a total of 3 Indicator Locations.
5. Not to exceed 35 days.
6. Time composite samples are samples which are collected with equipment capable of collecting an aliquot at time intervals which are short (e.g. hourly) relative to the compositing period.
7. At least once per 100 days.
8. At least once per 18 days.
9. At least once per 200 days.
10. The dose shall be calculated for the maximum organ and age group, using the guidance/methodology contained in Regulatory Guide 1.109, Rev. 1 and the parameters particular to the site.
11. Milk and forage sampling at the control location is only required when locations meeting the criteria of VII(A) are being sampled.

Table 7 – Supplemental Radiological Environmental Monitoring

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
AIRBORNE: S-I. Particulate	A) 1 Indicator sample monitoring the nearest community with the highest anticipated dose or ground level concentration.	Continuous sampler operation with weekly collection.	8	Gross beta following filter change; Monthly Composite (by location) for gamma isotopic.
S-II. Radioiodine	A) 1 Indicator sample to be taken from the location of S-1(A) above.	Continuous sampler operation with weekly collection.	8	Gamma isotopic for I-131 weekly.
S-III. Direct	A) 5 stations to be placed within the exclusion boundary. B) 2 stations to be placed around VCSNS sludge lagoons.	Quarterly exchange ⁷ ; two or more dosimeters at each location. Quarterly exchange ⁷ ; two or more dosimeters at each location.	61,62,63, 68 & 99 94,97	Gamma dose quarterly. Gamma dose quarterly.
WATERBORNE: S-IV. Surface Water	A) 1 indicator sample to be taken of the combined wastewater discharge. B) 1 Indicator sample taken at each storm drain outfall.	Composite samples with monthly collection. ^{13,5} Daily sample with monthly composite.	77 72,73	Gamma isotopic and tritium. Gamma isotopic and tritium.
S-VI. Drinking Water	A) 1 Indicator (finished water) sample to be taken on site.	Quarterly	99	Quarterly gamma isotopic, gross beta and tritium analysis†

Exposure Pathway and/or Sample	Criteria for Selection of Sample Number & Location	Sampling and Collection Frequency	Sample Location	Type & Frequency of Analysis
INGESTION: S-VII. Milk ⁴	A) 1 Sample from one of the nearest affected dairies at or beyond 5 miles.	Biweekly grab sample. ^{8,12,†}	14	Gamma isotopic and I-131 analysis biweekly.
	B) 1 Control sample to be taken at the location of a dairy greater than 20 miles distance and not in the most prevalent wind direction.	Biweekly grab sample. ^{8,12,†}	16	Gamma isotopic and I-131 analysis biweekly.
S-VII. Milk ⁴	C) 1 Indicator grass (forage) sample to be taken at the location of S-VII(A) above.	Monthly when available. ¹⁴	14	Gamma isotopic.
	D) 1 Control grass (forage) sample to be taken at the location of S-VII(B) above.	Monthly when available. ¹⁴	16	Gamma isotopic.
	E) 2 Indicator grass (forage) samples to be taken at 2 of the locations beyond but as close to the exclusion boundary as practical where the highest offsite sectorial ground level concentrations are anticipated.	Monthly when available.	2,7	Gamma isotopic.
	F) 1 Control grass (forage) sample to be used for routine monitoring along with S-IV(E) above.	Monthly when available.	18	Gamma isotopic.
S-VIII. Food Products	A) 1 Indicator sample of various types of foods grown in the area surrounding the plant (root, fruit, grain).	Annually during growing season. ¹¹	6,7	Gamma isotopic on edible portion.
Corbicula	B) Indicator sample of edible portions	Semiannual	23	Gamma isotopic
S-IX. Sediment/Sludge	A) 1 indicator sample from each storm drain outfall.	Semiannually	72,73	Gamma isotopic
	B) 3 indicator sludge samples taken at sludge lagoons.	Semiannually (Reference 2.6)	006A, 006B & 008	Gamma isotopic
Soil: S-X. Topsoil	A) 1 Indicator sample to be taken at the waste oil incinerator.	Annual grab sample. ¹¹	98	Gamma isotopic.

FOOTNOTES

1. Reserved for future use.
 2. Reserved for future use.
 3. Reserved for future use.
 4. Milking animal and garden survey results will be analyzed annually. If the survey should indicate new activity the owners shall be contacted with regard to a contract for supplying sufficient samples. If contractual arrangements can be made, site(s) will be added for additional milk sampling up to a total of 3 Indicator Locations.
 5. Not to exceed 35 days.
 6. Reserved for future use.
 7. At least once per 100 days.
 8. At least once per 18 days.
 9. At least once per 200 days.
 10. Reserved for future use.
 11. At least once per 400 days.
 12. Reserved for future use.
 13. Weekly, when circulating water is not operational.
 14. Milk and grass (forage) sampling is not required unless VCSNS gaseous releases exceed 5% of quarterly organ dose limits or radionuclides (attributed to VCSNS operation) are detected in broadleaf vegetation, grass or air samples at concentrations greater than required LLD. Sampling should continue for 2 months after plant releases are reduced to less than trigger levels and milk contamination levels have returned to background levels.
- The ODCM requires semimonthly sampling when animals are on pasture, monthly at other times.

Table 8 – Radiological Environmental Monitoring Program Summary for 2007

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed ¹	Lower Limit of Detection ² Actual (Max.)	All Indicator Locations Mean ³ (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ³ (#/total #) (Range)	Number of Nonroutine Reported ⁴ Measurements
				Name (Distance & Direction)	Mean ³ (#/total #) (Range)		
Air Particulate (pCi/m ³)	Gross Beta (312)	6.30E-3 (1.0E-2)	2.20E-2 (260/260) (9.54E-3 to 4.20E-2)	Site 7 Environmental Lab Garden (1.0 mi E)	2.41E-2 (52/52) (1.38E-2 to 3.96E-2)	2.07E-2 (52/52) (1.09E-2 to 3.49E-2)	0
	Gamma Spec (72)						
	¹³⁴ Cs	2.09E-3 (5.0E-2)	All < LLD			All < LLD	0
	¹³⁷ Cs	2.09E-3 (6.0E-2)	All < LLD			All < LLD	0
Air Radioiodine (pCi/m ³)	¹³¹ I (312)	2.03E-2 (7.0E-2)	All < LLD			All < LLD	0
Direct (TLD) ⁵ (μR/hr)	Gamma(133) Quarterly	N/A	8.26E+0 (114/114) (5.21E+0 to 1.23E+1)	Site 4, Fairfield Hydro (1.2 mi., WNW)	1.17E+1 (4/4) (1.08E+1 to 1.23E+1)	8.18E+0 (19/19) (5.44+0 to 1.11E+1)	0
	Gamma(24) Special Interest	N/A	8.73E+0 (24/24) (5.10E+0 to 1.18E+1)	Site 52 Monticello Rt. 11 (3.8 mi., NNE)	1.09E+1 (4/4) (1.01E+1 to 1.18E+1)	N/A	0
Surface Water (pCi/l)	³ H (35)	5.34E+2 (2.0E+3)	All < LLD			All < LLD	0
	Gamma Spec(35)						
	⁵⁴ Mn	2.20E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁸ Co	2.37E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁹ Fe	5.89E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁶⁰ Co	2.66E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁶⁵ Zn	4.86E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁶ Zr	4.35E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁵ Nb	2.99E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	2.03E+0 (1.5E+1)	All < LLD			All < LLD	0

Table 8 (cont.) - Radiological Environmental Monitoring Program Summary for 2007

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed ¹	Lower Limit of Detection ² Actual (Max.)	All Indicator Locations Mean ³ (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ³ (#/total #) (Range)	Number of Nonroutine Reported ⁴ Measurements
				Name (Distance & Direction)	Mean ³ (#/total #) (Range)		
Surface Water (Continued)	¹³⁷ Cs	2.41E+0 (1.8E+1)	All < LLD			All < LLD	0
	¹⁴⁰ Ba	1.47E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La	6.11E+0 (1.5E+1)	All < LLD			All < LLD	0
Ground Water (pCi/l)	³ H (80)	5.34E+2 N/A	6.98E+2 (3/76) (5.45E+2 to 9.53E+2)	Site #112 NPDES Well (GW-9) (0.36mi, SSE)	6.98E+2 (3/4) (5.45E+2 to 9.53E+2)	All < LLD	0
	Gamma Spec (80)						
	⁵⁴ Mn	4.98E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁸ Co	4.93E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁹ Fe	9.36E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁶⁰ Co	5.32E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁶⁶ Zn	1.06E+1 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁵ Zr	8.14E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁵ Nb	7.50E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	5.09E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	5.05E+0 (1.8E+1)	All < LLD			All < LLD	0
	¹⁴⁰ Ba	1.84E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La	6.65E+0 (1.5E+1)	All < LLD			All < LLD	0

Table 8 (Cont.) - Radiological Environmental Monitoring Program Summary for 2007

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed ¹	Lower Limit of Detection ² Actual (Max.)	All Indicator Locations Mean ³ (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ³ (#/total #) (Range)	Number of Nonroutine Reported ⁴ Measurements
				Name (Distance & Direction)	Mean ³ (#/total #) (Range)		
Drinking Water ⁶ (pCi/l)	Gross Beta (35)	1.41E+0 (4.00E+0)	2.35E+0 (20/24) (1.47E+0 to 4.65E+0)	Site 28, NTC (2.6 mi, 170.2 SSE)	2.57E+0 (10/12) (1.61E+0 to 4.65E+0)	2.12E+0 (11/12) (1.60E+0 to 2.67E+0)	0
	³ H (35)	5.13E+2 (2.0E+3)	All < LLD			All < LLD	0
	Gamma Spec (70) ¹⁰						
	⁵⁴ Mn	3.93E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁸ Co	3.84E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁹ Fe	7.68E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁶⁰ Co	4.04E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁶⁵ Zn	7.70E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁶ Zr	5.94E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁶ Nb	5.19E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³¹ I	4.03E-1 (1.0E+0)	5.41E-1 (1/24) (5.41E-1 to 5.41E-1)	Site 17, Columbia Water Works (25 mi, SE)	5.41E-1 (1/12) (5.41E-1 to 5.41E-1)	All < LLD	0
	¹³⁴ Cs	3.61E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	3.78E+0 (1.8E+1)	All < LLD			All < LLD	0
	¹⁴⁰ Ba	1.48E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La	5.50E+0 (1.5E+1)	All < LLD			All < LLD	0

Table 8 (Cont.)- Radiological Environmental Monitoring Program Summary for 2007

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed ¹	Lower Limit of Detection ² Actual (Max.)	All Indicator Locations Mean ³ (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ³ (#/total #) (Range)	Number of Nonroutine Reported ⁴ Measurements
				Name (Distance & Direction)	Mean ³ (#/total #) (Range)		
Broadleaf Vegetation (pCi/kg wet)	Gamma Spec (36)						
	¹³¹ I	2.24E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	2.10E+1 (6.0E+1)	All < LLD			All < LLD	0
Fish ⁷ (pCi/kg wet)	¹³⁷ Cs Gamma Spec (18)	2.38E+1 (8.0E+1)	All < LLD			All < LLD	0
	⁵⁴ Mn	1.52E+1 (1.3E+2)	All < LLD			All < LLD	0
	⁵⁸ Co	1.88E+1 (1.3E+2)	All < LLD			All < LLD	0
	⁵⁹ Fe	4.24E+1 (2.6E+2)	All < LLD			All < LLD	0
	⁶⁰ Co	2.09E+1 (1.3E+2)	All < LLD			All < LLD	0
	⁶⁵ Zn	4.31E+1 (2.6E+2)	All < LLD			All < LLD	0
	¹³⁴ Cs	1.50E+1 (1.3E+2)	All < LLD			All < LLD	0
	¹³⁷ Cs	1.85E+1 (1.5E+2)	1.31E+1 (1/12) (1.31E+1 to 1.31E+1)	Site 23 Monticello Reservoir (0.5 mi ESE)	1.31E+1 (1/6) (1.31E+1 to 1.31E+1)	1.57E+1 (1/6) (1.57E+1 to 1.57E+1)	0

Table 8 (Cont.)- Radiological Environmental Monitoring Program Summary for 2007

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed ¹	Lower Limit of Detection ² Actual (Max.)	All Indicator Locations Mean ³ (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ³ (#/total #) (Range)	Number of Nonroutine Reported ⁴ Measurements
				Name (Distance & Direction)	Mean ³ (#/total #) (Range)		
Sediment (pCi/kg) ⁸	Gamma Spec (6)						
	⁵⁴ Mn	2.10E+1 N/A	All < LLD			All < LLD	0
	⁵⁸ Co	1.81E+1 N/A	All < LLD			All < LLD	0
	⁶⁰ Co	2.76E+1 N/A	All < LLD			All < LLD	0
	¹³⁴ Cs	1.69E+1 (1.5E+2)	All < LLD			All < LLD	0
	¹³⁷ Cs	1.55E+1 (1.8E+2)	6.84E+1 (3/4) (4.52E+1 to 8.75E+1)	Site 23 Monticello Reservoir (0.5 mi ESE)	8.75E+1 (1/2) (8.75E+1 to 8.75E+1)	3.53E+1 (2/2) (9.15E+0 to 6.14E+1)	0

Table 8 (cont) - Radiological Environmental Monitoring Program Summary for 2007

Footnotes

1. Includes indicator and control analyses. Does not include supplemental samples. Site 8 Air Particulates and Air Radioiodines are included as indicators.
 2. Values given are maximum MDA values for indicator locations calculated from the program data analyses with maximum acceptable LLD values allowed from NRC guidelines are given in parentheses.
 3. Mean and range are based on detectable measurements only. The fractions of detectable measurements (i.e., number of positive results/total number of measurements) at specific locations are indicated in parentheses.
 4. Any confirmed measured level of radioactivity in any environmental medium that exceeds the reporting requirements of ODCM, Section 1.4.1.2.
 5. Detection sensitivity is approximately 10 mrem/yr (1.0 μ R/hr).
 6. Elevated levels of ^{214}Pb and ^{214}Bi were observed in Jenkinsville drinking water samples. The values are not reported here because they are naturally occurring (do not originate from VCSNS) and furnish no quantifiable information of interest.
 7. Fish include 3 groups (Bass, Bream/Crappie, Catfish/Carp.)
 8. Elevated levels of ^{214}Pb and ^{214}Bi plus other ^{226}Ra daughter products and ^{228}Ac plus other ^{232}Th daughter products were observed in all sediment samples. The values are not reported here because they are naturally occurring (do not originate from VCSNS) and furnish no quantifiable information of interest.
 9. Reserved for future use.
 10. Drinking water resin prepared and counted for ^{131}I as separate sample.
 11. Reserved for future use.
- * All measurements had positive results, no MDA values calculated.

Table 9– Radiological Environmental Program Preoperational (Baseline) Summary

Medium or Pathway Sampled (Unit of Measurement and Reporting Period)	Type and Total Number of Analyses Performed	Lower Limit of Detection ¹ Actual (Max.)	All Indicator Locations Mean ² (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ² (#/total #) (Range)	Number of Nonroutine Reported ³ Measurements
				Name (Distance & Direction)	Mean ² (#/total #) (Range)		
Air Particulate (pCi/m ³) (1981-1982)	Gross Beta (1300)	4.1E-3 (1.0E-2)	1.1E-1 (562/564) ⁴ (1.3E-2 to 5.5E-1)	Site 13, North Dam (2.9 mi NNW)	1.3E-1 (52/52) (2.1E-2 to 5.5E-1)	1.2E-1 (153/155) (7.9E-3 to 6.1E-1)	0
			2.7E-2 (456/462) ⁴ (9.3E-3 to 6.6E-2)	Site 8, Mon. Res. S of Rd 224 (1.5 ENE)	3.0E-2 (42/42) (1.2E-2 to 6.0E-2)	2.8E-2 (125/126) (1.2E-2 to 5.8E-2)	
	Gamma Spec (307)						
	¹³⁴ Cs	3.0E-3 (1.0E-2)	All < LLD			All < LLD	0
	¹³⁷ Cs	3.1E-3 (1.0E-2)	3.2E-3 (22/241) (1.5E-3 to 5.2E-3)	Site 10, Met Tower (2.4 mi NNE)	3.8E-3 (2/22) (2.5E-3 to 5.2E-3)	4.2E-3 (4/66) (3.2E-3 to 5.6E-3)	0
Air Radioiodine (pCi/m ³) (1982)	¹³¹ I (290)	3.6E-2 (7.0E-2)	All < LLD			All < LLD	0
Direct (TLD) ⁵ (μR/hr) (1978-1982)	Gamma (1220) Monthly	0.5 N/A	9.9 (915/915) (6.7 to 14.7)	Site 13, North Dam (2.9 mi NNW)	13.1 (61/61) (12.2 to 14.2)	9.7 (305/305) (6.4 to 13.5)	0
	Gamma (161) Quarterly	0.5 N/A	10.2 (154/154) (6.8 to 14.7)	Site 55, St. Barnabas Church (2.8 mi E)	14.0(7/7) (13.1 to 14.7)		0
Surface Water (pCi/l) (1981-1982)	³ H (43)	1.1E+3 (2.0E+3)	1.4E+3 (18/29) (1.1E+3 to 2.4E+3)	Site 17, Columbia Canal (24.7 mi, SE)	1.6E+3 (2/7) (1.4E+3 to 1.8E+3)	1.2E+3 (6/14) (6.7E+2 to 1.6E+3)	0
	Gamma Spec (140)						
	⁵⁴ Mn	2.7E-1 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁸ Co	2.9E-1 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁹ Fe	6.0E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁶⁰ Co	2.4E-1 (1.5E+1)	All < LLD			All < LLD	0
	⁶⁵ Zn	7.9E-1 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁵ Zr	5.2E-1 (1.5E+1)	All < LLD			All < LLD	0
	⁹⁵ Nb	3.3E-1 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	3.0E-1 (1.5E+1)	All < LLD			All < LLD	0

Medium or Pathway Sampled (Unit of Measurement and Reporting Period)	Type and Total Number of Analyses Performed	Lower Limit of Detection ¹ Actual (Max.)	All Indicator Locations Mean ² (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ² (#/total #) (Range)	Number of Nonroutine Reported ³ Measurements
				Name (Distance & Direction)	Mean ² (#/total #) (Range)		
	¹³⁷ Cs	2.2E-1 (1.8E+1)	All < LLD			All < LLD	0
	¹⁴⁰ Ba	2.2E+0 (6.0E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La (1982 only)	5.5E-1 (1.5E+1)	All < LLD			All < LLD	0
Ground Water (pCi/l) (1981-1982)	³ H (29) Gamma Spec (32)	9.0E+2 (2.0E+3)	1.5E+3 (16/16) (9.5E+2 to 2.3E+3)	Site 26, Onsite Well P4 (265 ft, W)	1.6E+3 (8/8) (9.5E+2 to 2.3E+3)	1.3E+3 (13/13) (1.0E+3 to 1.9E+3)	0
	⁵⁴ Mn	3.7E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁸ Co	3.8E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁵⁹ Fe	7.8E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁶⁰ Co	3.8E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁶⁵ Zn	8.1E+0 (3.0E+1)	All < LLD			All < LLD	0
	⁹⁵ Zr	6.8E+0 (1.5E+1)	All < LLD			All < LLD	0
	⁹⁵ Nb	4.6E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	3.7E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	3.8E+0 (1.8E+1)	All < LLD			All < LLD	0
	¹⁴⁰ Ba	1.9E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La (1982 only)	5.0E0 (1.5E+1)	All < LLD			All < LLD	0
Drinking Water ⁶ (pCi/l) (1981-1982)	Gross Beta ⁷	(2.0E+0)					
	³ H (14) Gamma Spec (44)	6.3E+2 (1.0E+3)	7.8E+2 (6/14) (6.8E+2 to 9.8E+2)	Site 28, Jenkinsville (2.0 mi SE) ⁷	8.4E+2 (3/7) (7.0E+2 to 9.8E+2)		0
	⁵⁴ Mn	3.0E-1 (1.5E+1)	All < LLD				0
	⁵⁸ Co	2.7E-1 (1.5E+1)	All < LLD				0

Medium or Pathway Sampled (Unit of Measurement and Reporting Period)	Type and Total Number of Analyses Performed	Lower Limit of Detection ¹ Actual (Max.)	All Indicator Locations Mean ² (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ² (#/total #) (Range)	Number of Nonroutine Reported ³ Measurements
				Name (Distance & Direction)	Mean ² (#/total #) (Range)		
	⁵⁹ Fe	9.6E0 (3.0E+1)	All < LLD				0
	⁶⁰ Co	2.6E-1 (1.5E+1)	All < LLD				0
	⁸⁵ Zn	3.4E-1 (3.0E+1)	All < LLD				0
	⁹⁵ Zr	4.8E-1 (1.5E+1)	All < LLD				0
	¹³¹ I	3.4E-1 (1.5E+1)	All < LLD				0
	⁹⁵ Nb	7.4E-1 (1.0E+0)	All < LLD				0
	¹³⁴ Cs	2.2E-1 (1.0E+1)	All < LLD				0
	¹³⁷ Cs	2.4E-1 (1.8E+1)	All < LLD				0
	¹⁴⁰ Ba	2.5E0 (6.0E+1)	All < LLD				0
	¹⁴⁰ La (1982 only)	4.4E-1 (1.5E+1)	All < LLD				0
Milk (pCi/l) (1981-1982)	Gamma Spec (94)						
	¹³¹ I	6.3E-1 (1.0E+0)	All < LLD			All < LLD	0
	¹³⁴ Cs	3.3E+0 (1.5E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	4.8E0 (1.5E+1)	4.1E+0 (8/47) (2.8E+0 to 6.1E+0)	Site 14, Dairy (5.1 mi., W)	4.1E+0 (8/47) (2.8E+0 to 6.1E+0)	5.7E+0 (37/47) (3.7E+0 to 9.2E+0)	0
	¹⁴⁰ Ba	1.1E+1 (1.5E+1)	All < LLD			All < LLD	0
	¹⁴⁰ La	4.4E+0 (1.5E+1)	All < LLD			All < LLD	0
Grass (pCi/kg wet) (1981-1982)	Gamma Spec (82)						
	¹³¹ I	6.7E+1 (6.0E+1)	All < LLD			All < LLD	0
	¹³⁴ Cs	2.7E+1 (8.0E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	3.3E+1 (8.0E+1)	5.0E+1 (13/51) (1.6E+1 to 1.6E+2)	Site 14, Dairy (5.1 mi W)	5.9E+1 (5/29) (1.6E+1 to 1.6E+2)	1.3E+2 (6/31) (1.3E+1 to 3.4E+2)	0

Medium or Pathway Sampled (Unit of Measurement and Reporting Period)	Type and Total Number of Analyses Performed	Lower Limit of Detection ¹ Actual (Max.)	All Indicator Locations Mean ² (#/total #) (Range)	Location with Highest Annual Mean		Control Locations Mean ² (#/total #) (Range)	Number of Nonroutine Reported ³ Measurements
				Name (Distance & Direction)	Mean ² (#/total #) (Range)		
Broadleaf Vegetation (pCi/kg wet) (1980-1982)	Gamma Spec (10)						
	¹³¹ I	3.7E+1 (6.0E+1)	All < LLD				0
	¹³⁴ Cs	1.9E+1 (8.0E+1)	All < LLD				0
	¹³⁷ Cs	2.1E+1 (8.0E+1)	3.1E+1 (2/7) (1.8E+1 to 3.6E+1)	Site 2, Trans. Line (1.2 mi SW)	3.6E+1 (1/1) (Single Value)	All < LLD	0
Other Vegetation (pCi/kg wet) (1980-1982)	Gamma Spec (32)						
	¹³⁴ Cs	8.4E+0 (8.0E+1)	All < LLD			All < LLD	0
	¹³⁷ Cs	1.0E+1 (8.0E+1)	All < LLD			All < LLD	0
Fish (pCi/kg wet) (1980 - 1982)	Gamma Spec (92)						
	¹³⁴ Cs	1.4E+1 (1.3E+2)	All < LLD			All < LLD	0
	¹³⁷ Cs	1.8E+1 (1.3E+2)	2.8E+1 (50/71) (1.1E+1 to 1.0E+2)	Site 24, Recreation Lake (5.5 mi, N)	3.4E+1 (17/23) 1.2E+1 to 1.0E+2)	3.1E+1 (19/21) (1.0E+1 to 7.9E+1)	0
	⁵⁸ Co	2.6E+1 (1.3E+2)	All < LLD			All < LLD	0
	⁵⁴ Mn	1.8E+1 (1.3E+2)	All < LLD			All < LLD	0
	⁶⁹ Fe	9.0E+1 (2.6E+2)	All < LLD			All < LLD	0
	⁶⁵ Zn	4.1E+1 (2.6E+2)	All < LLD			All < LLD	0
	⁶⁰ Co	1.8E+1 (1.3E+2)	All < LLD			All < LLD	0
Sediment (pCi/kg) (1980-1982)	Gamma Spec (24)						
	¹³⁴ Cs	2.3E+1 (1.5E+2)	All < LLD			All < LLD	0
	¹³⁷ Cs	2.4E+1 (1.5E+2)	1.7E+2 (12/18) (2.6E+1 to 4.5E+2)	Site 21, Parr Reservoir (2.7 mi, SSW)	2.6E+2 (6/6) (2.6E+1 to 4.5E+2)	4.2E+2 (6/6) (1.8E+1 to 1.0E+3)	0

Table 9 (Cont.)- Radiological Environmental Program Preoperational (Baseline) Summary

Footnotes

1. Values given are MDA values calculated from the program data analyses with maximum acceptable LLD values allowed from NRC guidelines given in parentheses.
2. Mean and range are based on detectable measurements only. The fractions of detectable measurements at specific locations are indicated in parentheses.
3. A non-routine measurement is any confirmed measured level of radioactivity in an environmental medium that exceeds the reporting requirements of VCSNS ODCM, Section 1.4.1.2.
4. The baseline values are high because of the fallout from the Chinese bomb test in 1980. The first set of data reflects the 1981 baseline. The second set of data reflects the 1982 baseline, essentially free of bomb test fallout. The 1982 data covers the period 1/1/82 - 10/22/82.
5. Detection sensitivity is approximately 5 mrem/yr (0.5 μ R/hr) determined from the analyses of five years of preoperational data.
6. No control location was specified for drinking water during the preoperational monitoring period.
7. Inconclusive data.

Table 10 - Results of 2007 Environmental Inter-comparison Program with Independent Lab, Analytics, Inc.

Comparison Study (Measurement Unit)	Date	Nuclides	Vendor Lab Results	Env Lab Results	Agreement
Gamma Isotopic Liquid 4 Liter (pCi/l)	9/19	¹³¹ I	80	91	Yes
		¹⁴¹ Ce	182	212	Yes
		⁵¹ Cr	249	295	Yes
		¹³⁴ Cs	127	136	Yes
		¹³⁷ Cs	112	137	Yes
		⁵⁸ Co	98	111	Yes
		⁵⁴ Mn	144	172	Yes
		⁵⁹ Fe	95	109	Yes
		⁶⁵ Zn	174	193	Yes
		⁶⁰ Co	127	142	Yes
Gamma Filter (pCi)	9/25	¹⁴¹ Ce	192	182	Yes
		⁵¹ Cr	263	281	Yes
		¹³⁴ Cs	134	107	Yes
		¹³⁷ Cs	119	125	Yes
		⁵⁸ Co	104	104	Yes
		⁵⁴ Mn	152	167	Yes
		⁵⁹ Fe	101	125	Yes
		⁶⁵ Zn	184	222	Yes
		⁶⁰ Co	135	135	Yes
		Alpha/Beta Water (pCi/l)	4/19	Alpha	112
Beta	100			131	Yes
Gamma Isotopic Pulverized Soil (pCi/g)	4/11	¹⁴¹ Ce	3.13E-1	3.13E-1	Yes
		⁵¹ Cr	2.58E-1	2.16E-1	Yes
		¹³⁴ Cs	1.18E-1	1.09E-1	Yes
		¹³⁷ Cs	3.45E-1	3.86E-1	Yes
		⁵⁸ Co	1.04E-1	1.15E-1	Yes
		⁵⁴ Mn	1.92E-1	1.83E-1	Yes
		⁵⁹ Fe	1.11E-1	1.42E-1	Yes
		⁶⁵ Zn	1.05E+0	1.12E+0	Yes
		⁶⁰ Co	1.60E-1	1.59E-1	Yes
		I-131 Solid (pCi)	4/11	¹³¹ I	99

Comparison Study (Measurement Unit)	Date	Nuclides	Vendor Lab Results	Env Lab Results	Agreement
Tritium (pCi/l)	4/23	³ H	5010	5140	Yes
Gross Beta Filter (pCi)	9/24	N/A	88	79	Yes
Charcoal Cartridge (pCi)	9/19	¹³¹ I	70	76	Yes

Table 11 – 2007 Environmental Sampling Program Exceptions

Media	Sample Location	Month (Week No.)	Cause for Exception
Direct Radiation	Site 47 Site 9 Site 20	Jul (30) Oct (41) Oct (41)	TLD missing TLD missing TLD missing
* Drinking Water	Site 17	Jul (32)	Breaker trip caused by storm
Surface Water	Site 21	Feb (8)	Power failure during modification to Parr Hydro

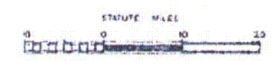
* Results included in Table 8 due to low levels of I-131 identified.



LEGEND

- CONTROL SAMPLE LOCATIONS
- A= AIR PARTICULATE SITE
- D= DIRECT (TLD) SITE
- I= AIRBORNE RADIOIODINE SITE
- W= WATER SITE
- O= OTHER (GARDEN PRODUCTS, FISH, SEDIMENT, GRASS, MILK)

REFERENCE:
 THE BASE FOR THIS MAP WAS PREPARED FROM A
 PORTION OF USGS STATE OF GEORGIA, 1978.



South Carolina Electric & Gas Co.
 Virgil C. Summer Nuclear Station

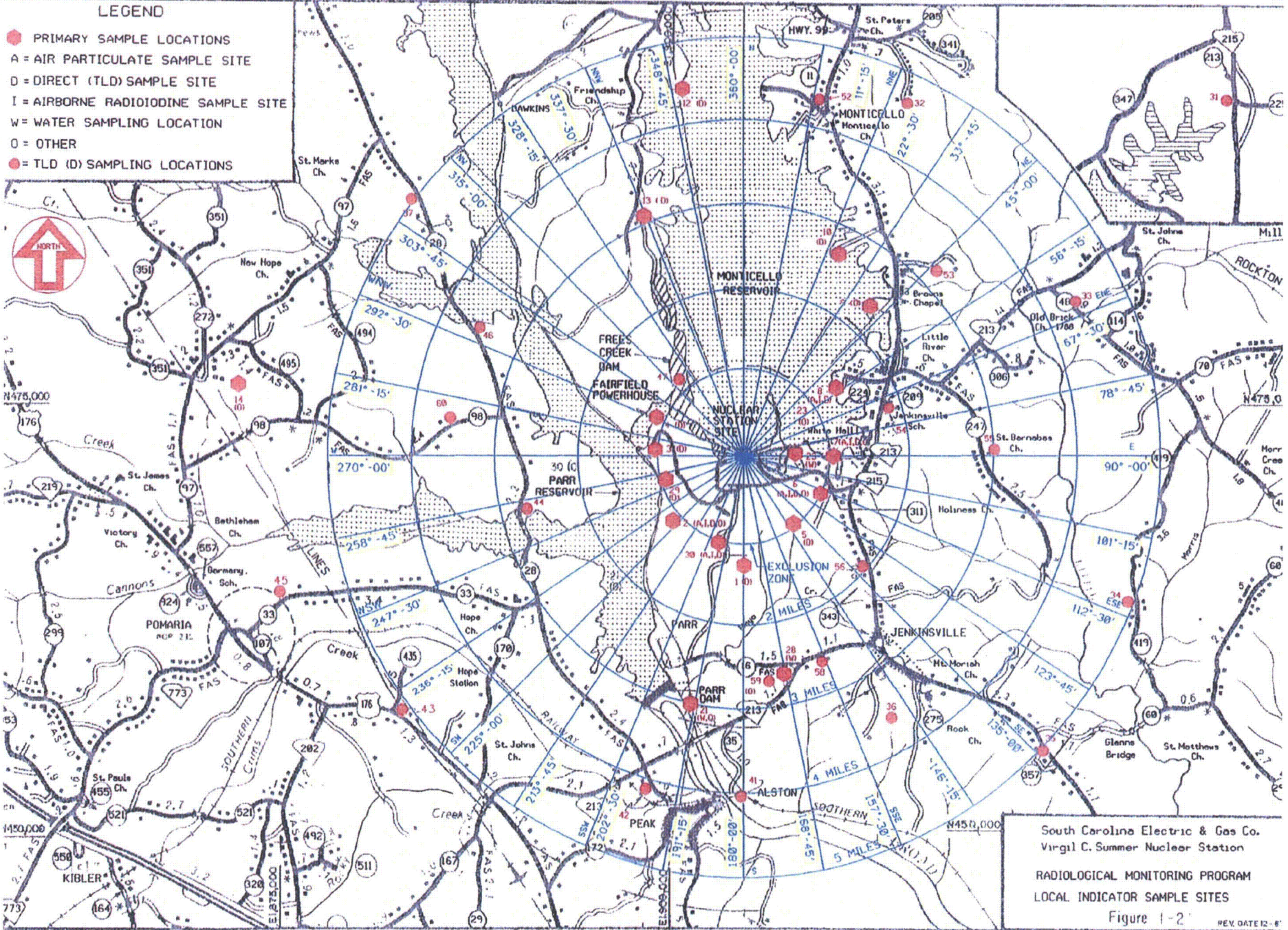
Regional Location Map

Figure 1-1

REV. DATE 12-8

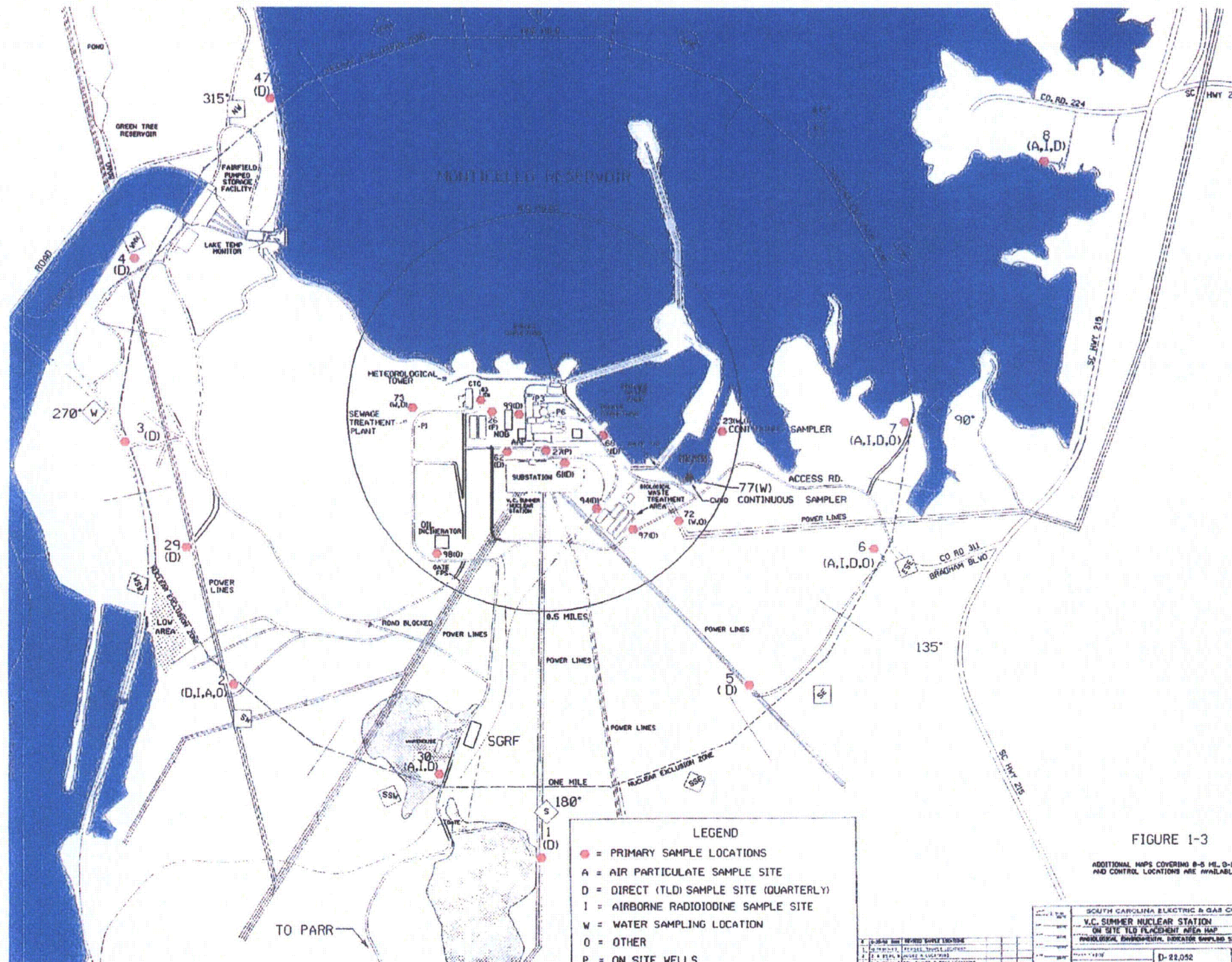
LEGEND

- PRIMARY SAMPLE LOCATIONS
- A = AIR PARTICULATE SAMPLE SITE
- D = DIRECT (TLD) SAMPLE SITE
- I = AIRBORNE RADIOIODINE SAMPLE SITE
- W = WATER SAMPLING LOCATION
- O = OTHER
- = TLD (D) SAMPLING LOCATIONS



South Carolina Electric & Gas Co.
 Virgil C. Summer Nuclear Station
 RADIOLOGICAL MONITORING PROGRAM
 LOCAL INDICATOR SAMPLE SITES

Figure 1-2' REV. DATE 12-8'



LEGEND

- = PRIMARY SAMPLE LOCATIONS
- A = AIR PARTICULATE SAMPLE SITE
- D = DIRECT (TLD) SAMPLE SITE (QUARTERLY)
- I = AIRBORNE RADIOIODINE SAMPLE SITE
- W = WATER SAMPLING LOCATION
- O = OTHER
- P = ON SITE WELLS

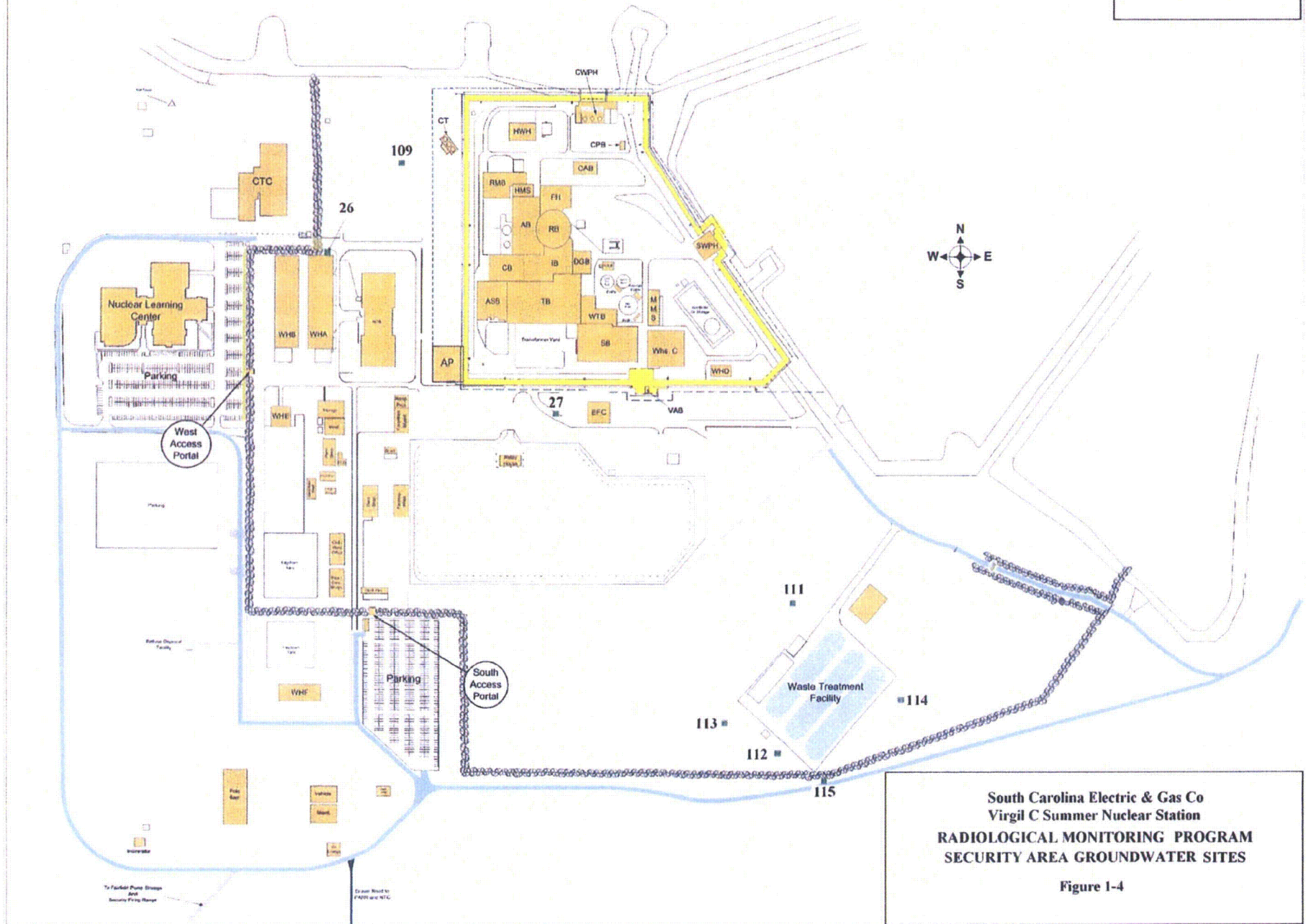
FIGURE 1-3

ADDITIONAL MAPS COVERING 8-5 MI. 0-1 AND CONTROL LOCATIONS ARE AVAILABLE.

SOUTH CAROLINA ELECTRIC & GAS CO.	
V.C. SUMMER NUCLEAR STATION	
ON-SITE TLD PLACEMENT AREA MAP	
METEOROLOGICAL ENVIRONMENTAL INDICATOR SAMPLING SITE	
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LEGEND

■ Groundwater Well





LEGEND
 ■ Groundwater Wells



South Carolina Electric & Gas Co
 Virgil C Summer Nuclear Station
**RADIOLOGICAL MONITORING PROGRAM
 PROTECTED AREA GROUNDWATER SITES**

Figure 1-5

South Carolina

Fish Consumption Advisories

2009

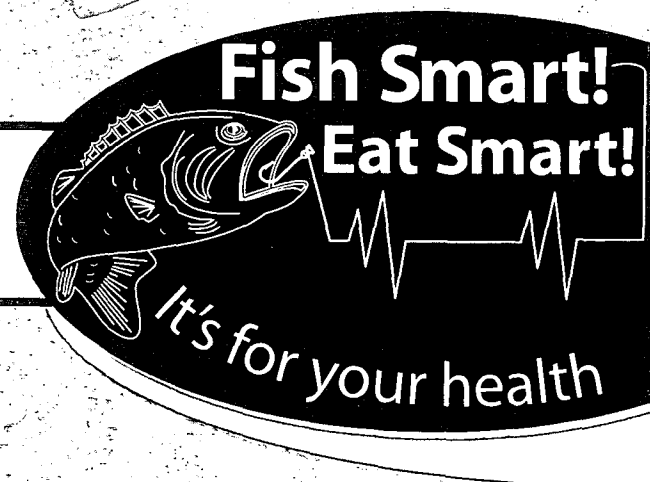


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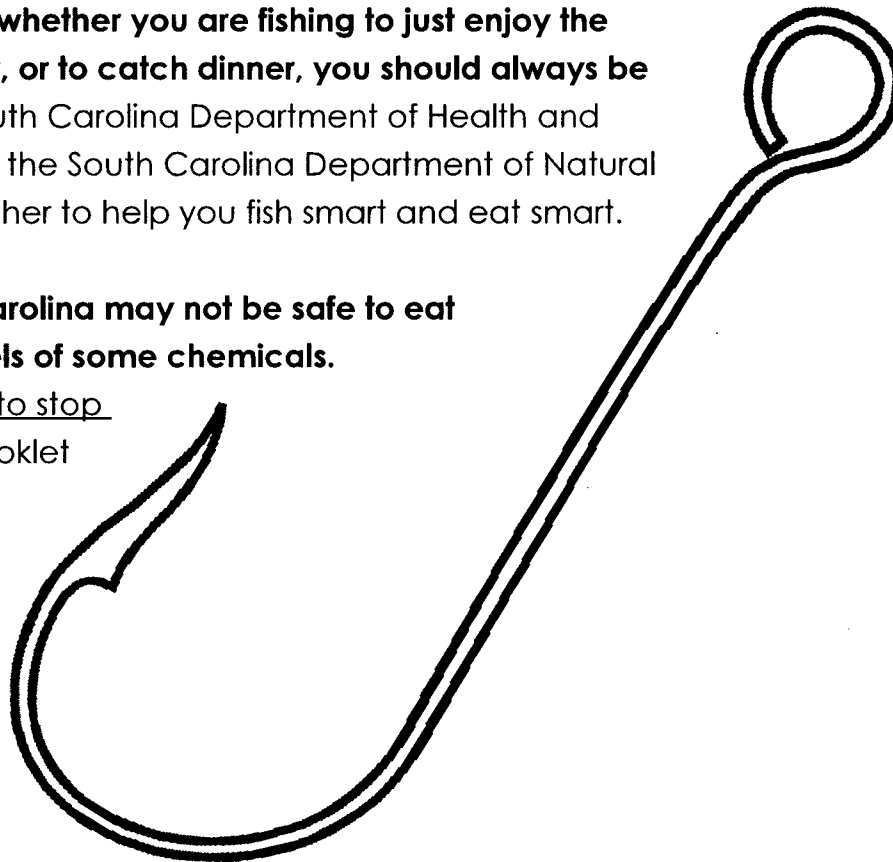
Fish Smart! Eat Smart! *It's for your health!*

Introduction

Fishing is a fun, relaxing outdoor activity, and fish are a good source of protein, vitamins and minerals. **But whether you are fishing to just enjoy the outdoors, to spend time with family, or to catch dinner, you should always be safe about the fish you eat.** The South Carolina Department of Health and Environmental Control (DHEC) and the South Carolina Department of Natural Resources (DNR) are working together to help you fish smart and eat smart.

Some fish caught in South Carolina may not be safe to eat because they contain harmful levels of some chemicals.

This does not mean that you have to stop eating fish. The advisories in this booklet tell you where you should limit the amount of fish you eat. They also tell you where it is safe to eat as much fish as you like.



Advice for High Risk Groups

High Risk Groups should follow the advice listed below. All other groups should follow the advice given in the advisory tables.

The high risk groups include:

- Babies
- Children under 14
- Women in childbearing years
- Women who are nursing
- Women who are pregnant

High Risk Groups
Do Not Eat Any Fish From
Waterbodies With An
Advisory



Advice for high risk groups:

- Do not eat any fish from waterbodies with an advisory (includes those listed in this booklet with an advisory for one meal a week, one meal a month, and do not eat any).
- Do NOT eat any king mackerel, shark, swordfish, or tilefish.
- Eat only one meal a week of freshwater fish caught from a waterbody without an advisory.

Why are these groups at a greater risk?

- Developing bodies, such as infants and small children, are at a greater risk since their brains and nervous systems are still forming.
- The body naturally removes small amounts of contaminants, like mercury.
- These contaminants can build up in our bodies if too much of these contaminants are being consumed.
- Health problems can occur when there are too many harmful chemicals in the body.

To find out more, visit EPA's web site at
www.epa.gov/ost/fish or go to FDA's web site at www.cfsan.fda.gov



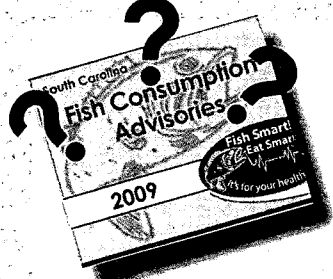
Frequently Asked Questions about Fishing and Eating Smart

Why should I eat fish?

- It's low in fat & contains omega-3 fatty acids (boosts heart health)
- It's a great source of protein, vitamins, & minerals
- Eating fish regularly can reduce your chances of having a stroke or heart attack
- *To get all the benefits, you should eat fish at least two meals each week, but remember to choose the right types of fish to eat.*
- **NOTE: Breeding & frying fish decreases health benefits**

What is an advisory?

- ❑ The advisory will list a lake, stream, or river in South Carolina. Then, it will tell you the **type of fish** and the **amount of fish** that is safe to eat in that area.
- ❑ If a waterbody or type of fish is **not listed** in the tables, it means that DHEC has not issued any consumption advice.
- ❑ Here are the reasons why DHEC may not issue an advisory:
 - The waterbody may not have been sampled.
 - There may not be enough data.
 - The waterbody is privately owned.
- ❑ Advisories help you decide:
 - Where to fish
 - Which fish to keep
 - How much fish to eat



Help Us Help You!

Take our survey at:
www.scdhec.gov/fish

If you do not have access to the Internet and would like to have one mailed to you, please call 1-888-849-7241 (Toll-Free).

- ❑ **No Advisories** – some lakes, streams, and rivers in South Carolina that have been tested do not have advisories. These are listed in boxes at the end of each regional section (Pages 16, 20, 29, & 33).

- ❑ **DON'T FORGET**

You will need a valid South Carolina Fishing license in order to fish in all public lakes, rivers, and streams, including all of the waterbodies listed in this booklet.

How does DHEC determine if a waterbody should have an advisory?

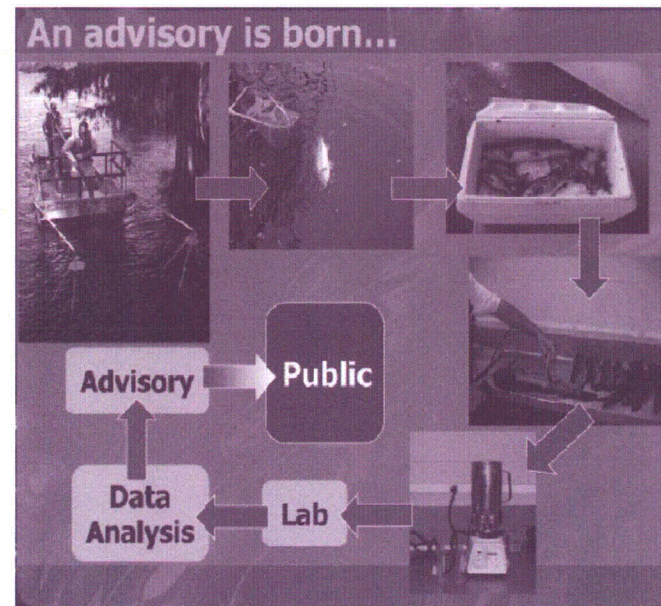
- DHEC tests fish from South Carolina's lakes, rivers, streams, estuaries, and offshore waters.
- Some saltwater fish samples are collected by both DHEC and DNR.
- All samples are tested for chemicals to see if any of the fish are contaminated.
- DHEC looks closely at the data and then issues fish consumption advisories where contaminated fish have been found.
- Once a contaminant has been found in a waterbody, DHEC tests additional species.

Why do we have advisories?

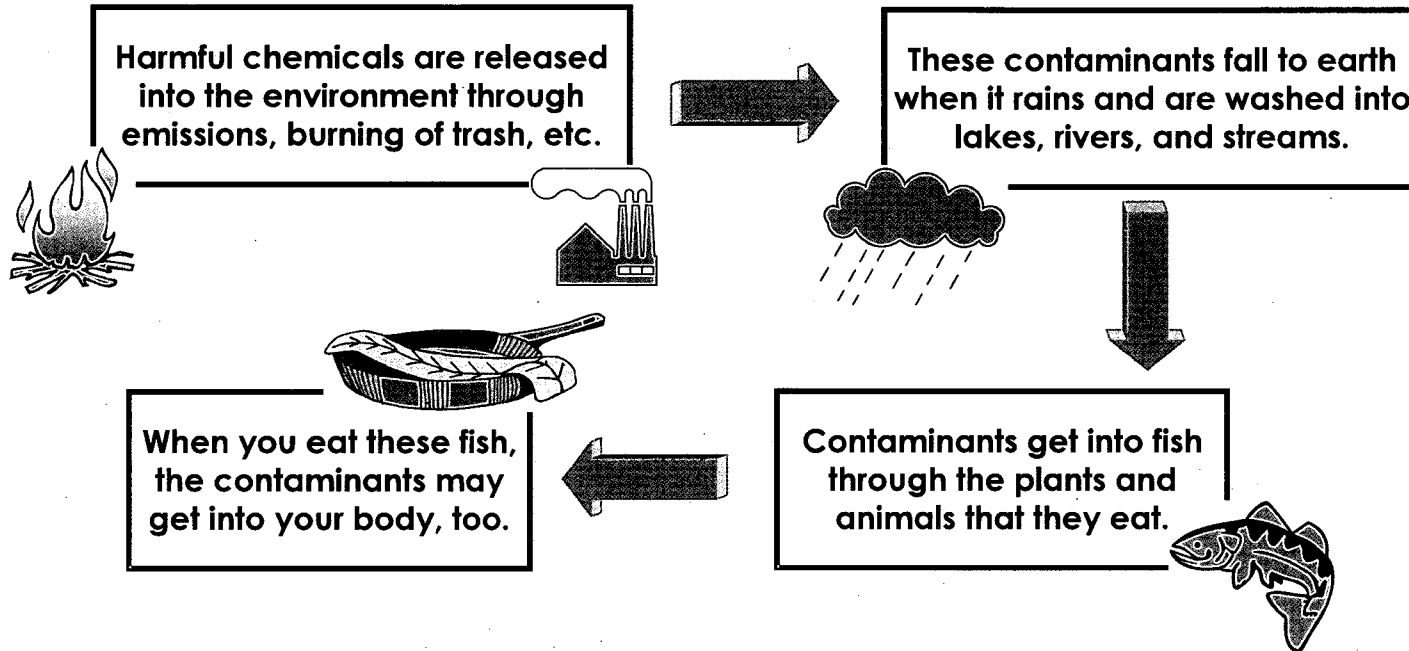
DHEC issues advisories to help ensure that the fish you catch are safe to eat.

Are fish consumption advisories only in South Carolina?

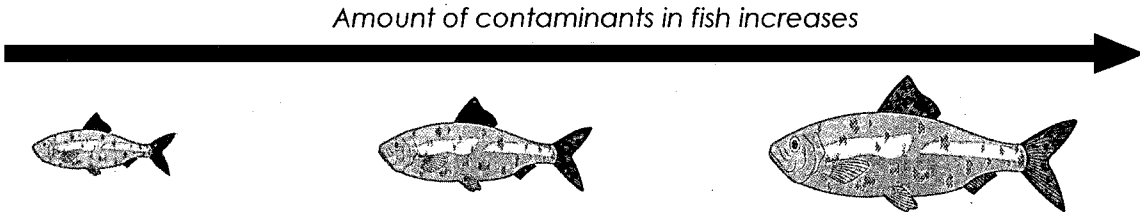
South Carolina is not alone. Most states have issued fish consumption advisories. To look at other states' advisories, go to <http://www.epa.gov/waterscience/fish/states.htm>.



Why are some fish not safe to eat?



General Rule of Thumb:
Older and larger fish have eaten more and have been in the water longer, so there may be more contaminants in their bodies.



What are the main contaminants in South Carolina?

- **Mercury**
- **PCBs** (found only in Lake Hartwell)
- **Radioisotopes** (found only in the Savannah River in very small amounts)

South Carolina's Fish Consumption Advisories are almost all due to mercury. To learn more about mercury, visit www.scdhec.gov/mercury

What do I need to know about mercury?

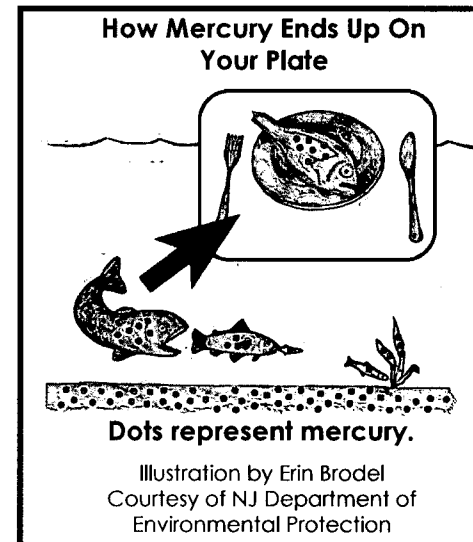
- Mercury in the environment comes from natural sources and from pollution.
- The largest sources of pollution have been from decades of burning fossil fuel (like coal) and waste.
- Mercury builds up in the tissue or muscle of the fish (part that we eat).
- It can also build up in our tissues when we eat fish contaminated with mercury.
- The danger is only in eating the fish, which means you can still enjoy water activities like swimming, boating, and other recreational activities.
- Our risk from mercury depends on how much and how often we eat certain types of fish.
- Mercury in fish is an issue for the whole nation, not just South Carolina.

What are the health effects of mercury in my body?

- **In unborn and young babies**
 - Brain damage
 - Blindness
 - Seizures
- **In children under 14**
 - Digestive problems
 - Kidney damage
 - Problems with their nervous systems
- **In adults**
 - Mouth, hands, or feet may tingle or feel numb
 - Cause vision or hearing problems

Important Notes

- Health problems due to mercury in children and unborn babies cannot always be corrected.
- All of these problems in adults can usually be corrected if a person stops eating fish that contain high levels of mercury.
- If you are concerned about the amount of mercury in your body, see your doctor.



What do I need to know about PCBs?

- Lake Hartwell and its connected waters is the only location in South Carolina that has PCB contamination.
- PCB stands for polychlorinated biphenyls.
- Man-made compounds; banned in 1976
- PCBs were often used as fluids for electrical transformers and products like cutting oils & carbonless copy paper.
- They remain a problem today because they do not break down easily in the environment.
- PCBs build up over time in the fatty parts of the fish.
- PCBs can also build up in our bodies.
- By cleaning or cooking fish to reduce fat, you can reduce the amount of PCBs you eat.
- See Page 11 for tips on how to clean and cook fish to reduce PCBs.
- You should still follow the advice of this book even if you clean and cook the fish the right way.

What are the health effects of PCBs in my body?

If pregnant women eat fish containing PCBs, their babies may suffer from:

- Lower birth weight
- Smaller infant head size
- Premature births
- Developmental problems and learning disabilities

What do I need to know about radioisotopes?

- Radioisotopes are radioactive forms of an element.
- Occur naturally or can be man-made
- Some fish found in the Savannah River may contain radioisotopes, cesium-137 and strontium-90.
- Levels of radioisotopes found in these fish in South Carolina are low and have decreased over time.
- If you follow the advice for the Savannah River, **the added health risk from these elements is very low.**

Smart Fishing Tip: Catch and Release

If you want to enjoy the fun of fishing, but don't want the health risks from eating contaminated fish, you should think about catch and release fishing. Catch and release still lets you have the experience of fishing without hurting the local fish population. When you catch and release, follow these simple guidelines:

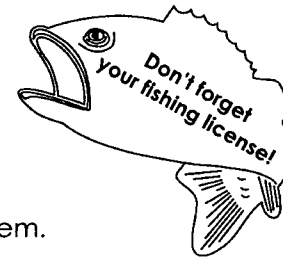
- Release fish quickly-while still in the water, if possible. Be sure you have the necessary tools (needlenose pliers) nearby.
- When a hook gets caught deep inside a fish, do not tear out the hook. Instead, cut the leader or the line and leave the hook in the fish. This will increase the chance that the fish lives.
- Do not play the fish to exhaustion, particularly if water temperatures are very high.

For more information about catch and release, visit www.dnr.sc.gov or read the South Carolina Rules and Regulations for Fishing, Hunting, & Wildlife Management Areas available wherever fishing licenses are sold.

How can I reduce the health risks from contaminated fish?

You can reduce the health risks from any type of fish by following these tips:

- Do not eat more fish than the advisory recommends.
- Eat fish from lakes and rivers that do not have advisories.
- Eat smaller fish and smaller amounts of fish.
- Eat different types of fish instead of just one type.
- Clean and cook your fish the right way (only helps reduce PCBs).
- Enjoy fishing by catching and releasing the fish instead of eating them.



What do I need to know about shellfish in South Carolina to stay safe?

- DHEC regularly tests the salt waters containing shellfish beds for bacteria.
- If health standards are not met, or if conditions have changed to make the shellfish unsafe, DHEC will close the shellfish bed.
- A closed shellfish bed means that it is unsafe to eat and illegal to collect the shellfish in that area.
- Testing ensures that the oysters, clams, and mussels you collect and eat in South Carolina salt waters are safe.

Need More Info?

- ☐ For more information on DHEC's Shellfish program, visit www.scdhec.gov/shellfish
- ☐ For shellfish closure updates, call 1-800-285-1618.



What about fish that I buy instead of catch?

- The U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA) have issued a **national mercury advisory for fish that you buy**.
- The advisory includes fresh, frozen, and canned fish that you buy at a store or restaurant.
- EPA and FDA advice for women in the high-risk group:
 - Do not eat Shark, Swordfish, King Mackerel, or Tilefish.
 - Eat up to 12 ounces (2 avg. meals) a week of a variety of fish and shellfish that are lower in mercury.
 - Check local advisories in your state for fish caught by your family and friends.
- Follow the same advice when feeding fish and shellfish to young children only serve them a smaller portion.

Need more info about store bought fish?



- Visit FDA's web site at: www.cfsan.fda.gov/~lrd/seafsaf.html
- Or call their toll-free information line at 1-888-SAFEFOOD
- Visit EPA's web site at: www.epa.gov/ost/fish



Does DHEC post signs on waterbodies with fish consumption advisories?

- **Yes**, DHEC does post signs on public boat landings that are access points to the waterbody under advisory.

What if a waterbody does not have a sign at the access point?

- Here are reasons why there may not be a sign at the access point to a waterbody:
 - There is no advisory
 - The waterbody has not been tested
 - The sign has been vandalized or damaged
- Always refer to DHEC's Fish Consumption Advisory website (www.scdhec.gov/fish) or this booklet for the most accurate information on whether a waterbody is under advisory.

Where can I get more information about topics discussed in this booklet?



- For the SC Fish Consumption Advisory web site, go to www.scdhec.gov/fish
- You can also call DHEC's toll-free number at 1-888-849-7241
- To learn more about mercury, visit www.scdhec.gov/mercury
- For more information on fishing and SC's Rules and Regulations for fishing & boating, visit DNR's web site at www.dnr.sc.gov
- Visit <http://screelkids.dnr.sc.gov/> for information on a free fishing program for kids.



Understanding the Advisories

HOW TO FIND AN ADVISORY

❑ Search by Region

- The map of South Carolina is divided into four sections (page 12).
- The waterbodies are listed in alphabetical order within each section.
- Find your waterbody of interest and follow the consumption advice related to that species of fish.

❑ Search by Waterbody

- If you have a specific waterbody you are looking for, go to Page 36 for a complete index of waterbodies.

EATING FISH FROM WATERBODIES UNDER ADVISORY**

**See Page 2 - additional advice for women and children

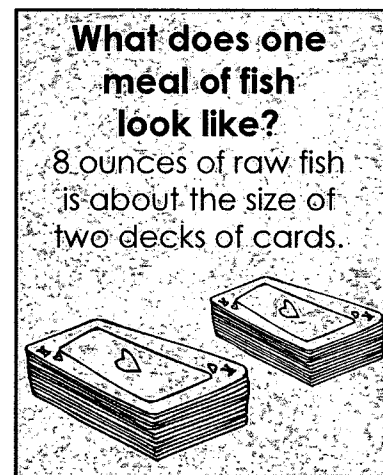
❑ Portion Sizes

- Advisories are based on 1 meal of fish.
- One meal of fish = ½ pound or 8 ounces (raw) of fish
- 8 ounces of raw fish = about the size of 2 decks of playing cards

❑ Spacing Your Consumption

When eating fish from waterbodies under advisory, you should space out your meals based on the advice given.

- **1 meal a week** = you may eat 8 ounces of fish once in that week
- **1 meal a month** = you may eat 8 ounces of fish once in that month
- **No Restrictions** = this means that you can eat that type of fish in that waterbody as often as you like.



□ **Example**

- Blue catfish in the Edisto River have an advisory for one meal per month.
- So if you eat a meal of blue catfish from the Edisto River, you should not eat any more fish under a mercury advisory for the rest of that month.

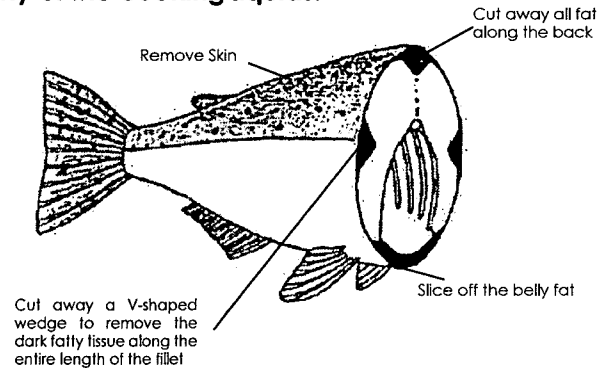
More clarification...

- This includes: other fish from the Edisto River as well as anywhere else with an advisory.
- Bluegill and black crappie from the Edisto River, largemouth bass from Lake Jocassee, and bowfin (mudfish) in the Congaree all have advisories. To follow the advice correctly, you would not eat any of these fish in the same month that you ate the blue catfish from the Edisto River.

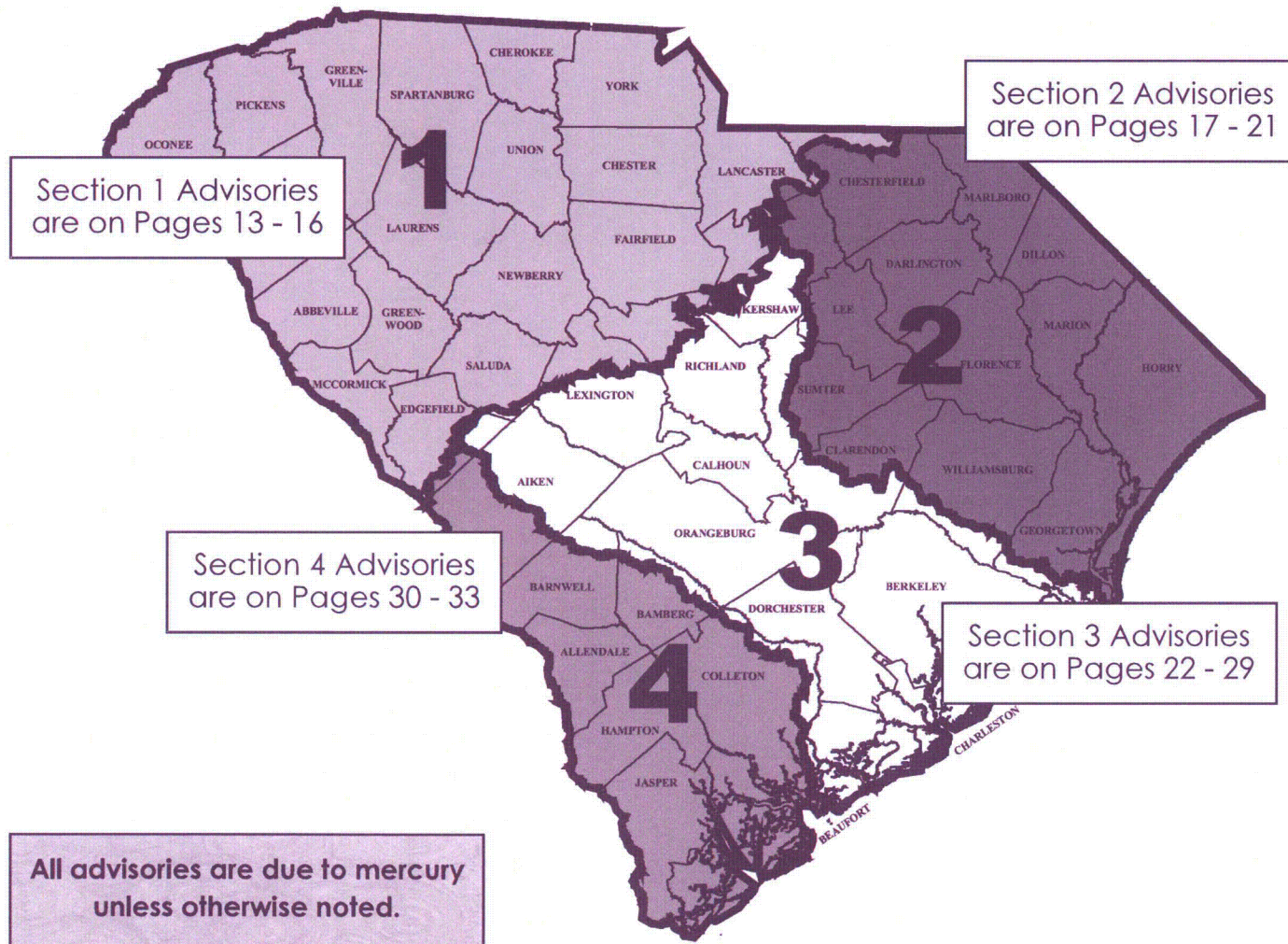
Cleaning and Cooking Fish to Reduce PCBs

Fish in and around Lake Hartwell contain harmful levels of PCBs. You can reduce your exposure to PCBs by the way you prepare the fish. PCBs are found in the fatty parts of fish. By cleaning or cooking fish to reduce fat, you can also reduce the amount of contaminants you eat.

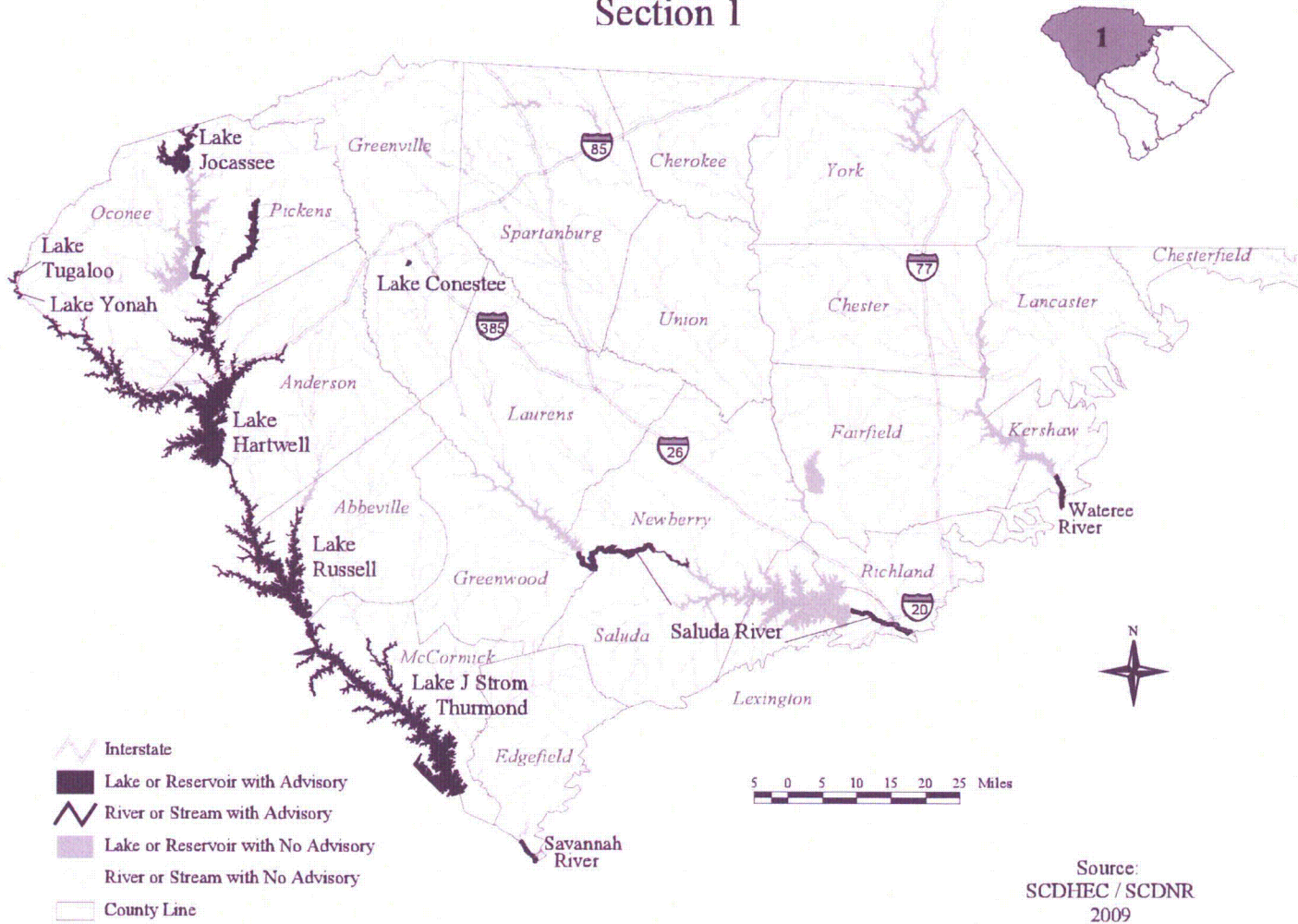
- **Remove the head and all the guts.**
- **Remove the skin and trim all fat from the areas shown in the picture.**
- **Don't panfry or deep fry. Broil, bake, poach or boil your fish so the fatty juices drip away.**
- **Don't eat or use any of the cooking liquids.**



South Carolina Fish Consumption Advisories



South Carolina Fish Consumption Advisories Section 1





Section 1 Waterbodies with Advisories

see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Lake Conestee	Impounded portions only (fish contain both mercury and chlordane)	Largemouth Bass	DO NOT EAT ANY
		Redear Sunfish	DO NOT EAT ANY
Lake Hartwell PCB Advisory See Page 11 to learn how to cook and clean fish from Lake Hartwell.	12 Mile Creek	All Species of Fish	DO NOT EAT ANY
	Seneca River Arm	All Species of Fish	DO NOT EAT ANY
	All remaining waters	Channel Catfish	1 meal a month
		Largemouth Bass	1 meal a month
		Hybrid Bass/Striped Bass	DO NOT EAT ANY
	State of Georgia advisory for Lake Hartwell (Tugaloo Arm). For more information on GA fish advisories, call the GA Department of Natural Resources at (706) 369-6376.	Black Crappie	No Restrictions
		Channel Catfish less than 16 inches	No Restrictions
		Channel Catfish over 16 inches	1 meal a month
		Largemouth Bass less than 16 inches	1 meal a week
		Largemouth Bass over 16 inches	1 meal a month
Hybrid/Striped Bass less than 12 inches		No Restrictions	
Hybrid/Striped Bass 12-16 inches	1 meal a month		
Hybrid/Striped Bass over 16 inches	DO NOT EAT ANY		
Lake Jocassee	Entire Lake	Bluegill	No Restrictions
		Brown Trout	No Restrictions
		Rainbow Trout	No Restrictions
		Redbreast Sunfish	No Restrictions
		Spotted Bass	1 meal a week
		Smallmouth Bass	No Restrictions
		Largemouth Bass	1 meal a week
Lake Russell	Entire Lake	Largemouth Bass	1 meal a week
		Black Crappie	No Restrictions
		Redear Sunfish	No Restrictions
		Spotted Bass	1 meal a week

DID YOU KNOW?

SC DHEC has issued fish consumption advisories since 1976.





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Lake J. Strom Thurmond (Clarks Hill Lake)"	Entire Lake	Black Crappie	No Restrictions
		Redbreast Sunfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Redear Sunfish	No Restrictions
		Largemouth Bass	1 meal a week
		Chain Pickerel	No Restrictions
Lake Tugaloo	Entire Lake	Bluegill	No Restrictions
		Black Crappie	1 meal a week
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		White Catfish	No Restrictions
		Yellow Perch	No Restrictions
Lake Yonah	Entire Lake	Largemouth Bass	1 meal a month
		Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Redbreast Sunfish	No Restrictions
		Yellow Perch	No Restrictions
Saluda River	From Lake Greenwood Dam to the Congaree River in Columbia, S.C. (does not include Lake Murray)	Black Crappie	No Restrictions
		Bluegill	1 meal a week
		Channel Catfish	No Restrictions
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		White Bass	No Restrictions
		Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	1 meal a week

How You Can Reduce PCBs when Consuming Contaminated Fish



Bluegill (Sunfish)

- Eat leaner fish such as Yellow Perch, Sunfish, and Crappie.
- Eat smaller fish.
- Follow the directions for properly cleaning and cooking fish (Page 11).



Yellow Perch



Black Crappie





see Page 2 - additional advice for women and children

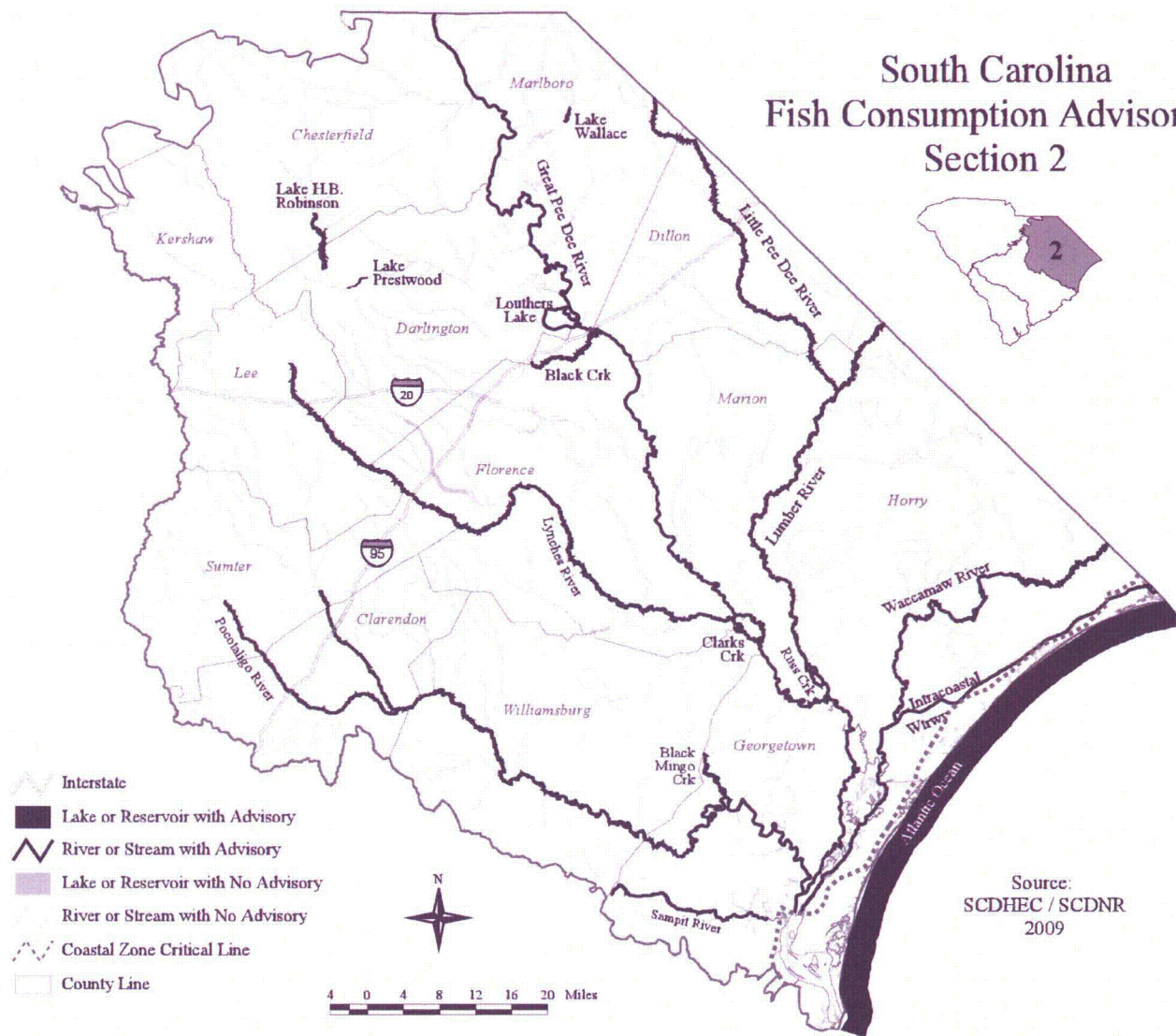
WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Savannah River <i>Some data for the Savannah River was provided by the Georgia Department of Natural Resources.</i> <i>Some fish also contain cesium-137 and strontium-90. See p. 7 to find out more.</i>	From Lake J. Strom Thurmond to Stevens Creek	All Species of Fish	No Restrictions
	From Stevens Creek in Edgefield County to S.C. Hwy. 119 in Jasper County	Black Crappie	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	1 meal a week
		Channel Catfish	No Restrictions
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		Warmouth	No Restrictions
		Yellow Perch	No Restrictions
		Spotted Sucker	1 meal a week
		Largemouth Bass	1 meal a month
		Bowfin (Mudfish)	DO NOT EAT ANY
Wateree River Entire River (Downstream of Lake Wateree to the Congaree River)	Black Crappie	No Restrictions	
	Blue Catfish	No Restrictions	
	Bluegill	No Restrictions	
	Channel Catfish	No Restrictions	
	Largemouth Bass	No Restrictions	
	Redbreast Sunfish	No Restrictions	
	Flathead Catfish	1 meal a week	
	Redear Sunfish	No Restrictions	
	Striped Bass	No Restrictions	
	White Perch	No Restrictions	
Bowfin (Mudfish)	1 meal a week		

NO ADVISORIES (eat as many fish as you'd like from these waterbodies)

- Broad River
- Broadway Lake
- Catawba River
- Cedar Creek Reservoir
- Fishing Creek Reservoir
- Lake Blalock
- Lake Bowen
- Lake Cooley
- Lake Cunningham
- Lake Greenwood
- Lake J.A. Robinson (Greenville County)
- Lake Keowee
- Lake Monticello
- Lake Monticello Sub-Impoundment
- Lake Murray
- Lake Rabon
- Lake Secession
- Lake Wateree
- Lake Wylie
- Little River
- Middle Tyger River
- North Tyger River
- Parr Reservoir



South Carolina Fish Consumption Advisories Section 2





Section 2 Waterbodies with Advisories

see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Atlantic Ocean	Atlantic Ocean off the S.C. Coast **EPA and FDA advise women who are or may become pregnant, nursing mothers, and children under 14 not to eat any king mackerel, shark, swordfish or tilefish.	King Mackerel less than 33 inches	No Restrictions **
		King Mackerel 33-39 inches	1 meal a week **
		King Mackerel over 39 inches	DO NOT EAT ANY **
		Swordfish	1 meal a month **
		Shark	DO NOT EAT ANY **
		Tilefish	DO NOT EAT ANY **
Black Creek	Entire Creek (Florence County)	Bluegill	No Restrictions
		Redbreast Sunfish	No Restrictions
		Channel Catfish	1 meal a week
		Redear Sunfish	1 meal a week
		Largemouth Bass	1 meal a month
		Bowfin (Mudfish)	1 meal a month
Black Mingo Creek	Entire Creek (Georgetown County)	Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Largemouth Bass	1 meal a month
		Bowfin (Mudfish)	DO NOT EAT ANY
Black River	Entire River	Black Crappie	1 meal a week
		Blue Catfish	1 meal a week
		Bluegill	1 meal a week
		Chain Pickerel	1 meal a month
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Warmouth	1 meal a week
		Largemouth Bass	DO NOT EAT ANY
		Bowfin (Mudfish)	1 meal a month
Clarks Creek	Williamsburg County	All Species of Fish	1 meal a month





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Great Pee Dee River	Entire River in S.C.	Black Crappie	No Restrictions
		Blue Catfish	1 meal a week
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Redear Sunfish	1 meal a week
		Warmouth	No Restrictions
	From NC/SC Border to I-95 in Dillon County, SC	Bowfin (Mudfish)	1 meal a week
		Largemouth Bass	1 meal a week
		From I-95 to Winyah Bay	Bowfin (Mudfish)
Intracoastal Waterway	Horry County	Largemouth Bass	1 meal a month
		Bluegill	1 meal a week
		Largemouth Bass	1 meal a week
		Redear Sunfish	1 meal a week
Lake H.B. Robinson	Entire Lake	Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	1 meal a month
		Chain Pickerel	1 meal a week
		Warmouth	1 meal a week
		Redear Sunfish	No Restrictions
		Bluegill	1 meal a week
Lake Prestwood	Entire Lake	Largemouth Bass	1 meal a week
		Redear Sunfish	No Restrictions
		Bowfin (Mudfish)	No Restrictions
Lake Wallace	Diversion Lake	Largemouth Bass	1 meal per month
	Fishing Lake	Bowfin (Mudfish)	DO NOT EAT ANY
		Channel Catfish	No Restrictions
		Largemouth Bass	1 meal per week
Little Pee Dee River	From N.C./S.C. State Line to the Great Pee Dee River	All Other Fish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
		Blue Catfish	DO NOT EAT ANY
		Chain Pickerel	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Louthers Lake	Entire Lake	Bluegill	No Restrictions
		Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	1 meal a week
Lumber River	From N.C./S.C. State Line to the Little Pee Dee River	Bluegill	1 meal a month
		Chain Pickerel	1 meal a week
		Channel Catfish	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Redear Sunfish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
Lynches River	From U.S. Hwy. 15 to the Great Pee Dee River	Bluegill	No Restrictions
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	1 meal a week
		Largemouth Bass	1 meal a month
		Chain Pickerel	1 meal a month
		Channel Catfish	DO NOT EAT ANY
		Bowfin (Mudfish)	DO NOT EAT ANY
Pocotaligo River	Entire River (From Sumter to the Black River)	All Other Fish	1 meal a week
		Chain Pickerel	DO NOT EAT ANY
		Bowfin (Mudfish)	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
Russ Creek	Marion County	Redear Sunfish	1 meal a week
		Largemouth Bass	1 meal a month
		Bowfin (Mudfish)	1 meal a month
Sampit River	Georgetown County	Black Crappie	No Restrictions
		Mullet	No Restrictions
		Bluegill Sunfish	No Restrictions
		Pumpkinseed Sunfish	No Restrictions
		White Perch	No Restrictions
		Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	1 meal a week
<p>NO ADVISORIES for Winyah Bay (eat as many fish as you'd like from this waterbody) ***Dolphin (Mahi Mahi) and Spanish Mackerel are safe to eat anywhere along SC's coast***</p>			





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Waccamaw River	From the N.C./S.C. State Line to Hwy 17	Black Crappie	1 meal a week
		Blue Catfish	1 meal a week
		Bluegill	1 meal a week
		Channel Catfish	1 meal a week
		Redear Sunfish	1 meal a week
		Warmouth	1 meal a week
		Chain Pickerel	1 meal a month
		Bowfin (Mudfish)	DO NOT EAT ANY
Largemouth Bass	DO NOT EAT ANY		



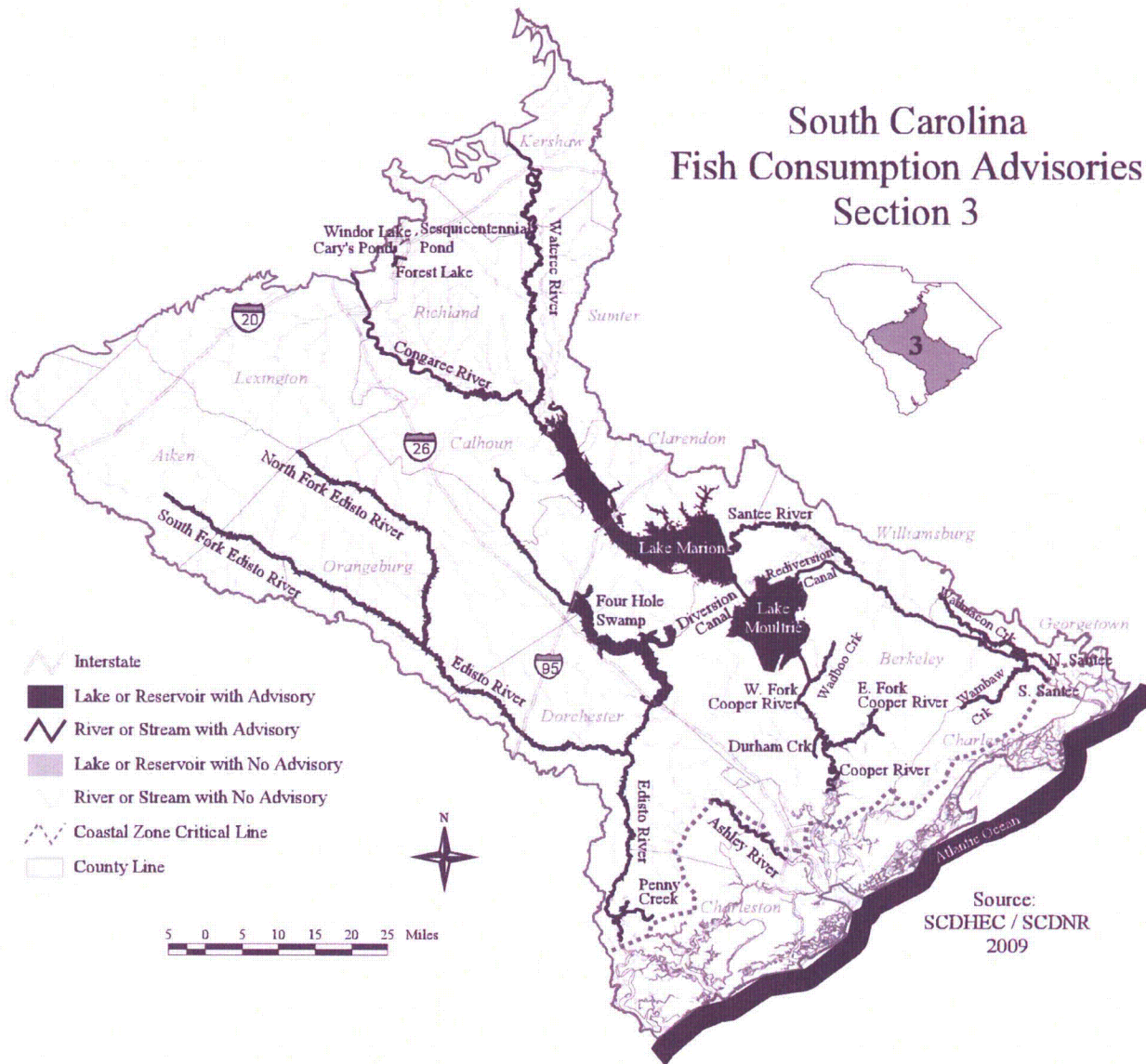
To identify the different types of fish in South Carolina, go to Pages 34 and 35.



Species with higher amounts of Mercury	Species with lower amounts of Mercury
Bowfin (Mudfish)	Canned light tuna
Catfish	Shrimp
Largemouth Bass	Salmon
Warmouth	Dolphin (Mahi-mahi)
Shark	Flounder
King Mackerel	Speckled trout (spotted sea trout)
Swordfish	Oysters
Tilfish	Lobster



South Carolina Fish Consumption Advisories Section 3





Section 3 Waterbodies with Advisories

see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Ashley River	From State Rd. 165 to Hwy 526	Bluegill	1 meal a week
		Blue Catfish	1 meal a week
		Black Crappie	1 meal a week
		Channel Catfish	No Restrictions
		Redear Sunfish	No Restrictions
		Redbreast Sunfish	1 meal a week
		Largemouth Bass	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
Atlantic Ocean	Atlantic Ocean off the S.C. Coast **EPA and FDA advise women who are or may become pregnant, nursing mothers, and children under 14 not to eat any king mackerel, shark, swordfish or tilefish.	King Mackerel less than 33 inches	No Restrictions **
		King Mackerel 33-39 inches	1 meal a week **
		King Mackerel over 39 inches	DO NOT EAT ANY **
		Swordfish	1 meal a month **
		Shark	DO NOT EAT ANY **
		Tilefish	DO NOT EAT ANY **
Cary's Lake	Entire Lake	Largemouth Bass	1 meal a week
Congaree River	From Columbia to the Santee River	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Chain Pickerel	No Restrictions
		Largemouth Bass	1 meal a week
		Redear Sunfish	No Restrictions
		Striped Bass	No Restrictions
		Bowfin (Mudfish)	1 meal a week





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Cooper River	East Fork Cooper River Quinby Creek to the "T"	Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Spotted Sunfish	No Restrictions
		Warmouth	No Restrictions
		Bowfin (Mudfish)	1 meal a month
		Chain Pickerel	1 meal a week
		Largemouth Bass	1 meal a week
	West Fork Cooper River From Lake Moultrie Dam to the "T"	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	No Restrictions
		Largemouth Bass	No Restrictions
		Redear Sunfish	No Restrictions
		Warmouth	No Restrictions
		Bowfin (Mudfish)	1 meal a week
	The "T" to Bushy Park	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	No Restrictions
Largemouth Bass		No Restrictions	
Redear Sunfish		No Restrictions	
Warmouth		No Restrictions	
Bowfin (Mudfish)		1 meal a month	
Downstream of Bushy Park	Red Drum	No Restrictions	
	Spotted Sea Trout	No Restrictions	
	Southern Flounder	No Restrictions	
	Striped Mullet	No Restrictions	





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Durham Creek	Entire Creek (Berkeley County)	Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	No Restrictions
		Largemouth Bass	1 meal a week
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		Warmouth	No Restrictions
		Bowfin (Mudfish)	1 meal a week
Edisto River	Entire River to Willtown Bluff	Black Crappie	1 meal a week
		Blue Catfish	1 meal a month
		Bluegill	1 meal a week
		Channel Catfish	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
		Chain Pickerel	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
Forest Lake	Entire Lake	Largemouth Bass	1 meal a week
		Black Crappie	No Restrictions
		Bluegill Sunfish	No Restrictions
Four Hole Swamp	Entire Swamp	Bluegill	1 meal a week
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
		Warmouth	1 meal a week
		Chain Pickerel	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Lake Marion	Entire Lake	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	No Restrictions
		Channel Catfish	No Restrictions
		Largemouth Bass	1 meal a week
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		Warmouth	No Restrictions
		Yellow Perch	No Restrictions
		Bowfin (Mudfish)	1 meal a week
Diversion Canal (Santee Cooper Lakes)	Entire Canal	Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Largemouth Bass	1 meal a week
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
Rediversion Canal (Santee Cooper Lakes)	Entire Canal	Black Crappie	No Restrictions
		Channel Catfish	No Restrictions
		Blue Catfish	1 meal a week
		Bluegill	No Restrictions
		Largemouth Bass	1 meal a week
Lake Moultrie (continued on next page)	Entire Lake	Bowfin (Mudfish)	1 meal a week
		Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Largemouth Bass	No Restrictions
		Redbreast Sunfish	No Restrictions
Redear Sunfish	No Restrictions		





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Lake Moultrie (continued from previous page)	Entire Lake	Warmouth	No Restrictions
		Yellow Perch	No Restrictions
		Chain Pickerel	No Restrictions
		Bowfin (Mudfish)	1 meal a week
North Fork Edisto River	Orangeburg County	Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Chain Pickerel	1 meal a month
		Striped Bass	1 meal a week
		Largemouth Bass	1 meal a month
		Warmouth	1 meal a month
		Bowfin (Mudfish)	DO NOT EAT ANY
North Santee River	From the Santee River to U.S. Hwy. 17/701 Bridge	Black Crappie	1 meal a week
		Bluegill	No Restrictions
		Red Drum	No Restrictions
		Striped Mullet	No Restrictions
		Chain Pickerel	1 meal a week
		Blue Catfish	1 meal a week
		Flathead Catfish	1 meal a week
		Largemouth Bass	1 meal a week
Bowfin (Mudfish)	1 meal a week		
Penny Creek	Charleston County	Bowfin (Mudfish)	DO NOT EAT ANY
		Striped Bass	1 meal a month
Santee River	From Lake Marion to the South Santee River	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		Striped Mullet	No Restrictions
		Bowfin (Mudfish)	1 meal a week
		Largemouth Bass	1 meal a month





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Sesquicentennial State Park	Entire Lake	Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Black Crappie	1 meal a month
		Chain Pickerel	1 meal a month
		Largemouth Bass	DO NOT EAT ANY
South Fork Edisto River	From Aiken State Park to Edisto River	Chain Pickerel	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Largemouth Bass	DO NOT EAT ANY
South Santee River	From the Santee River to U.S. Hwy. 17/701 Bridge	Blue Catfish	1 meal a week
		Flathead Catfish	DO NOT EAT ANY
		Largemouth Bass	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
Wadboo Creek	Berkeley County to Hwy 17	Bluegill	No Restrictions
		Chain Pickerel	No Restrictions
		Largemouth Bass	1 meal a week
		Redear Sunfish	No Restrictions
		Bowfin (Mudfish)	1 meal a week
Wadmacon Creek	Georgetown County	Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Bowfin (Mudfish)	1 meal a week
		Largemouth Bass	1 meal a week
Wambaw Creek	Charleston County	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Largemouth Bass	No Restrictions
		Redbreast Sunfish	No Restrictions
		Bowfin (Mudfish)	1 meal a week





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Wateree River	Entire River (Downstream of Lake Wateree to the Congaree River)	Black Crappie	No Restrictions
		Blue Catfish	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	No Restrictions
		Largemouth Bass	No Restrictions
		Redbreast Sunfish	No Restrictions
		Flathead Catfish	1 meal a week
		Redear Sunfish	No Restrictions
		Striped Bass	No Restrictions
		White Perch	No Restrictions
		Bowfin (Mudfish)	1 meal a week
Windsor Lake	Entire Lake	Largemouth Bass	1 meal a week

NO ADVISORIES (eat as many fish as you'd like from the following waterbodies)

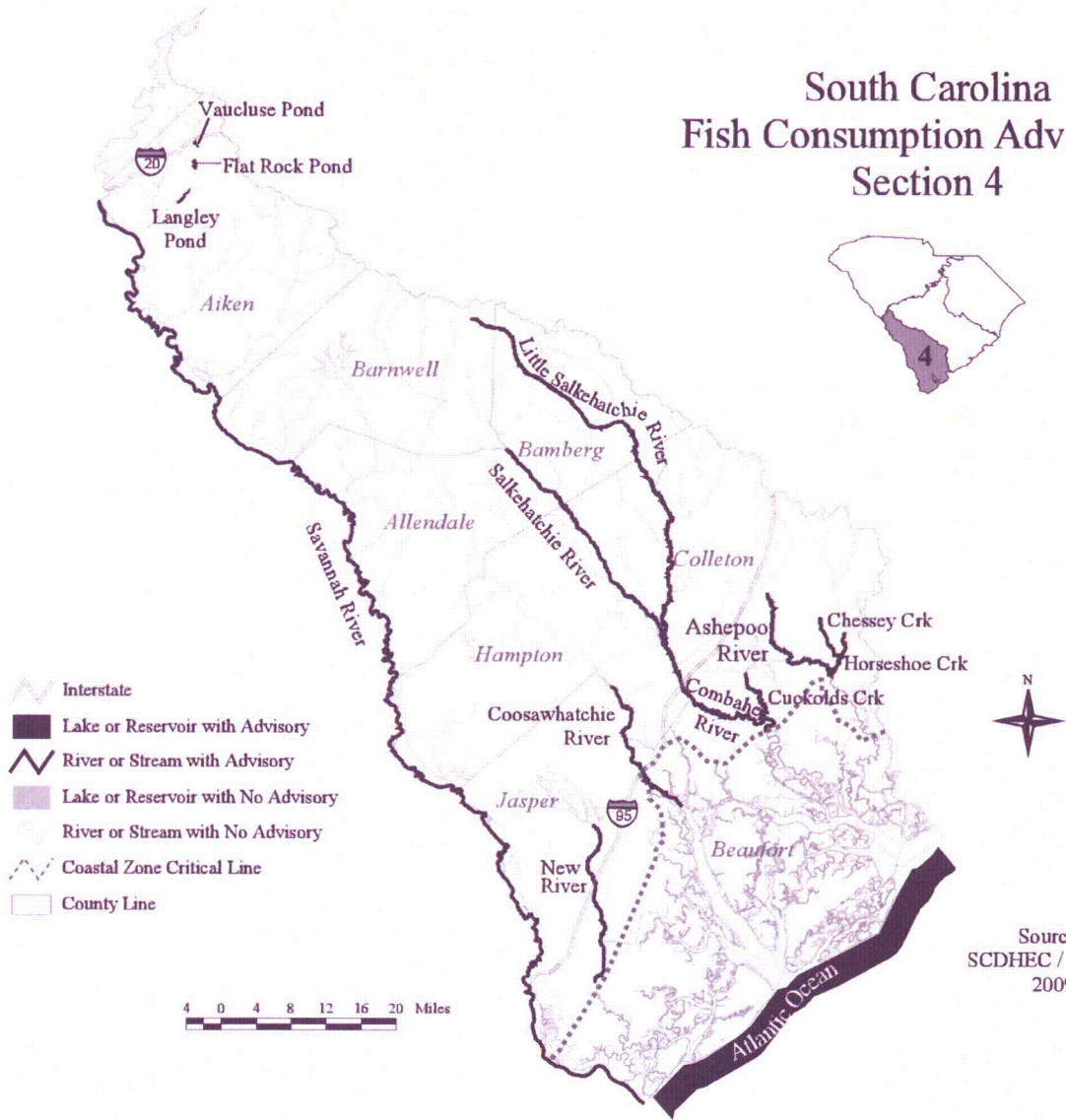
- Cape Romain
- Ashley River (downstream of U.S. Hwy 17)
- Charleston Harbor
- Muddy Bay
- Edisto River (downstream of U.S. Hwy 17)
- Lower Wando River
- Back River Reservoir
- Goose Creek Reservoir

*****Dolphin (Mahi Mahi) and Spanish Mackerel are safe to eat anywhere along SC's coast*****

PCBs	MERCURY
Stored in the fat PCBs remain in the body for long periods of time—may take several years to be fully removed from the body	Stored in the muscle May take up to a year to be completely removed from the body assuming no more mercury is being ingested.
Trimming the fat off the fish can reduce the amount of PCBs by 50%	Trimming the fat will not reduce the amount of mercury since it is found in the protein (meat) of the fish.
It's better to boil, bake, or grill. Broiling and frying is not the best way to reduce PCBs.	Cooking methods will not remove mercury contaminants.
Larger fish have greater amount of PCBs in them due to age and diet.	Larger fish have greater amounts of mercury in them due to age and diet.



South Carolina Fish Consumption Advisories Section 4





Section 4 Waterbodies with Advisories

see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Ashepoo River	From Walterboro to U.S. Hwy. 17	Bluegill	No Restrictions
		Black Crappie	No Restrictions
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	1 meal a week
Atlantic Ocean	Atlantic Ocean off the S.C. Coast **EPA and FDA advise women who are or may become pregnant, nursing mothers, and children under 14 not to eat any king mackerel, shark, swordfish or tilefish.	King Mackerel less than 33 inches	No Restrictions **
		King Mackerel 33-39 inches	1 meal a week **
		King Mackerel over 39 inches	DO NOT EAT ANY **
		Swordfish	1 meal a month **
		Shark	DO NOT EAT ANY **
		Tilefish	DO NOT EAT ANY **
Chessey Creek	Colleton County	Bowfin (Mudfish)	No Restrictions
		Largemouth Bass	1 meal a week
Combahee River	Salkehatchie River to U.S. Hwy. 17	Black Crappie	No Restrictions
		Bluegill	No Restrictions
		Channel Catfish	1 meal a week
		Redbreast Sunfish	No Restrictions
		White Catfish	No Restrictions
		Largemouth Bass	DO NOT EAT ANY
		Redear Sunfish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
Chain Pickerel	DO NOT EAT ANY		
Coosawhatchie River	Jasper County	All Other Fish	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
		Chain Pickerel	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
		Warmouth	DO NOT EAT ANY
Cuckolds Creek	Colleton County	Bluegill	No Restrictions
		Bowfin (Mudfish)	1 meal a month
		Largemouth Bass	No Restrictions





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Flat Rock Pond	Entire Pond	Channel Catfish	No Restrictions
		Largemouth Bass	1 meal a week
		Warmouth	1 meal a week
Horseshoe Creek	Colleton County	Bowfin (Mudfish)	1 meal a week
		Redear Sunfish	1 meal a week
		Bluegill	No Restrictions
		Black Crappie	No Restrictions
		Largemouth Bass	1 meal a week
Langley Pond	Entire Pond	All Other Fish	1 meal a week
		Black Crappie	1 meal a month
		Chain Pickerel	1 meal a month
		Channel Catfish	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
Little Salkehatchie River	Entire River	All Other Fish	1 meal a week
		Chain Pickerel	1 meal a month
		Warmouth	1 meal a month
		Bowfin (Mudfish)	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
New River	Jasper County to Cook Landing	Largemouth Bass	DO NOT EAT ANY
		Black Crappie	1 meal a week
		Chain Pickerel	1 meal a week
		Redbreast Sunfish	No Restrictions
		Bluegill	No Restrictions
		Redear Sunfish	No Restrictions
		Bowfin (Mudfish)	DO NOT EAT ANY
Salkehatchie River	From U.S. Hwy. 301 to Combahee River	Bowfin (Mudfish)	DO NOT EAT ANY
		Chain Pickerel	1 meal a month
		Warmouth	1 meal a week
		Redbreast Sunfish	1 meal a week
		Largemouth Bass	1 meal a month





see Page 2 - additional advice for women and children

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
<p>Savannah River</p> <p><i>Some data for the Savannah River was provided by the Georgia Department of Natural Resources.</i></p> <p><i>Some fish also contain cesium-137 and strontium-90. See Page 7 to find out more.</i></p>	<p>From Stevens Creek in Edgefield County to S.C. Hwy. 119 in Jasper County</p>	Black Crappie	No Restrictions
		Bluegill	No Restrictions
		Chain Pickerel	1 meal a week
		Channel Catfish	No Restrictions
		Redbreast Sunfish	No Restrictions
		Redear Sunfish	No Restrictions
		Warmouth	No Restrictions
		Yellow Perch	No Restrictions
		Largemouth Bass	1 meal a month
		Spotted Sucker	1 meal a week
		Bowfin (Mudfish)	DO NOT EAT ANY
	<p>From S.C. Hwy. 119 in Jasper County to U.S. Hwy. 17</p>	Black Crappie	1 meal a week
		Bluegill	1 meal a week
		Channel Catfish	1 meal a week
		Redbreast Sunfish	1 meal a week
		Redear Sunfish	1 meal a week
		White Catfish	1 meal a week
		Largemouth Bass	DO NOT EAT ANY
		Bowfin (Mudfish)	DO NOT EAT ANY
	<p>Downstream of U.S. Hwy. 17</p>	Red Drum	No Restrictions
		Channel Catfish	1 meal a week
Largemouth Bass		1 meal a week	
White Catfish		1 meal a week	
<p>Vauluse Pond</p>	<p>Entire Pond</p>	Bluegill	No Restrictions
		Chain Pickerel	1 meal a month
		Warmouth	1 meal a week
		Yellow Perch	1 meal a week
		Redear Sunfish	No Restrictions
		Largemouth Bass	DO NOT EAT ANY

NO ADVISORIES (eat as many fish as you'd like from the following waterbodies)

- Combahee River (downstream of U.S. Hwy 17)
- Port Royal Sound

*****Dolphin (Mahi Mahi) and Spanish Mackerel are safe to eat anywhere along SC's coast*****



Identifying Common South Carolina Fish

Fishing is a great way to relax and spend time with family and friends. If you plan to keep what you catch, make sure you can positively identify your fish. This not only helps make sure it meets size and catch regulations, it can also keep you healthy. Use these images to help positively identify your catch.



Black Crappie



Bowfin
(Mudfish)



Channel Catfish



King Mackerel



Blue Catfish



Brown Trout



Flathead Catfish



Largemouth Bass



Bluegill



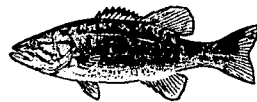
Chain Pickerel



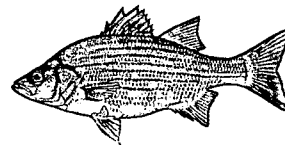
Hybrid Bass



Mullet



Smallmouth Bass



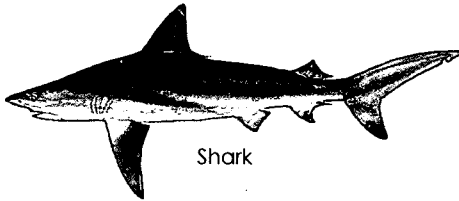
White Bass



Spotted Bass



Pumpkinseed Sunfish



Shark



Striped Bass



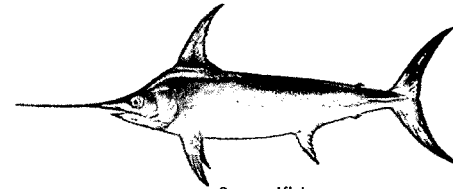
Rainbow Trout



Redbreast Sunfish



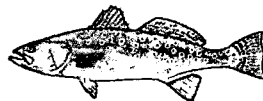
Southern Flounder



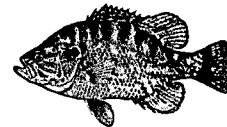
Swordfish



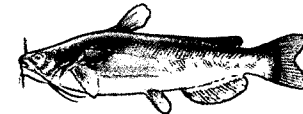
Red Drum



Spotted Sea trout



Warmouth



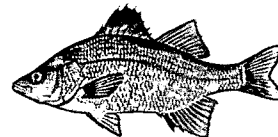
White Catfish



Redear Sunfish



Spotted Sucker



White Perch



Yellow Perch

Index of Listed Waterbodies

Ashepoo River	31	Lake Bowen	16	Lumber River	20
Ashley River	23, 29	Lake Conestee	14	Lynches River	20
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Back River Reservoir	29	Lake Cunningham	16	Muddy Bay	29
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Black River	18	Lake Hartwell	14	North Santee River	27
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Lake Blalock	16				

For More Information:

South Carolina Fish Consumption Advisories and Information

South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
1-888-849-7241 (toll-free)
www.scdhec.gov/fish

South Carolina Fishing and Boating Rules and Regulations

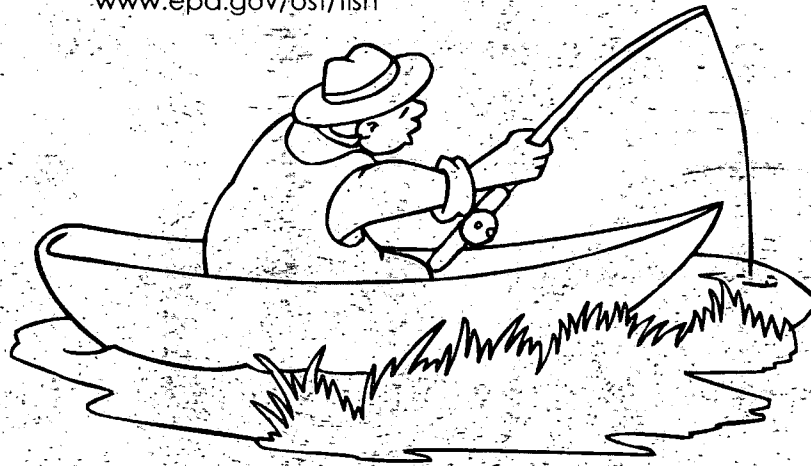
South Carolina Department of Natural Resources
P.O. Box 167
Columbia, SC 29202
(803) 734-3886
www.dnr.sc.gov

National Fish Consumption Advisories

Food and Drug Administration & Environmental Protection Agency
1-888-SAFE-FOOD (toll-free)
www.cfsan.fda.gov/seafood1.html
www.epa.gov/ost/fish

Georgia Fish Consumption Advisories

Georgia Department of Natural Resources
2 Martin Luther King, Jr. Drive, S.E., Suite 1152
Atlanta, GA 30334-9000
(706) 369-6376
www.gadnr.org

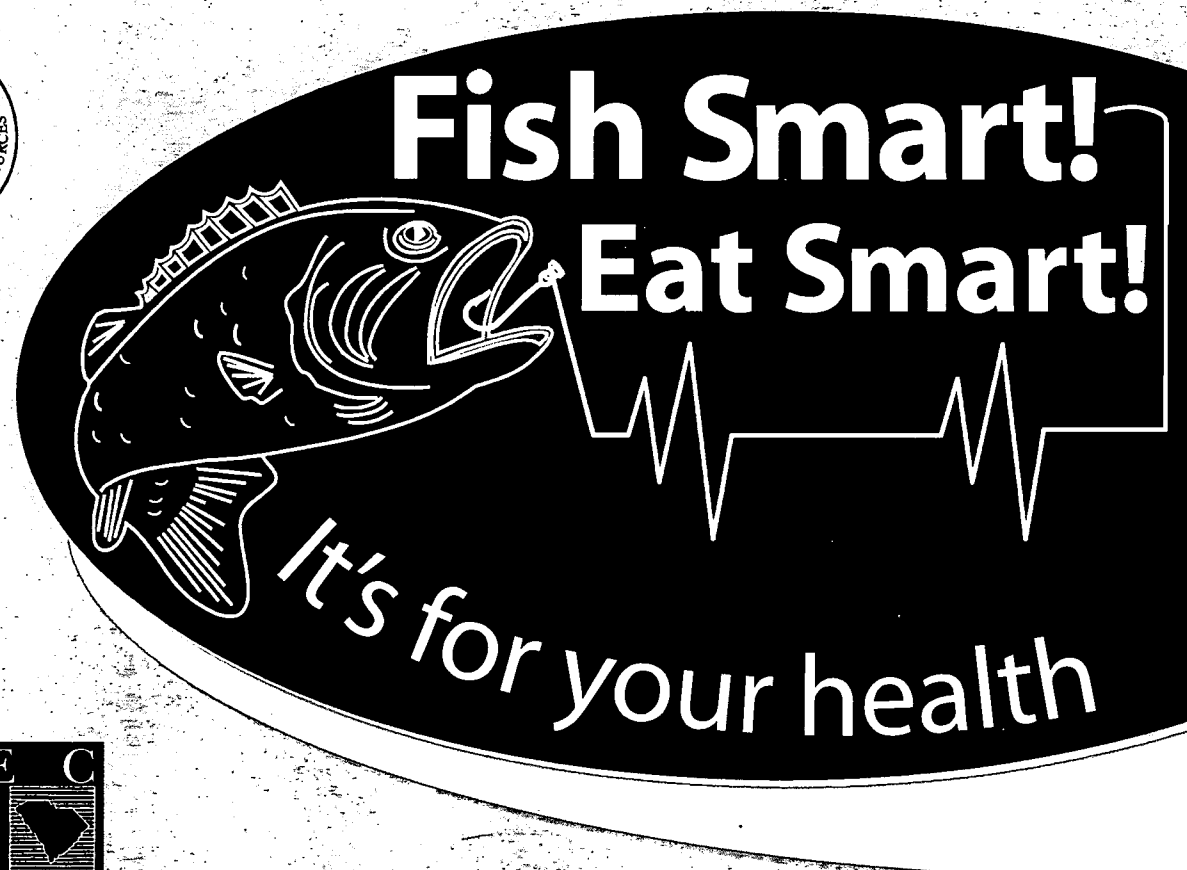


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