

Section J - Sequoyah Nuclear Plant

Tennessee Valley Authority's Sequoyah Nuclear Plant is a two-unit Pressurized Water Reactor (PWR) facility located in Hamilton County, Tennessee approximately 20 miles northeast of Rossville, Georgia. Westinghouse Electric Corporation supplied this facility, which has been in operation since 1980.

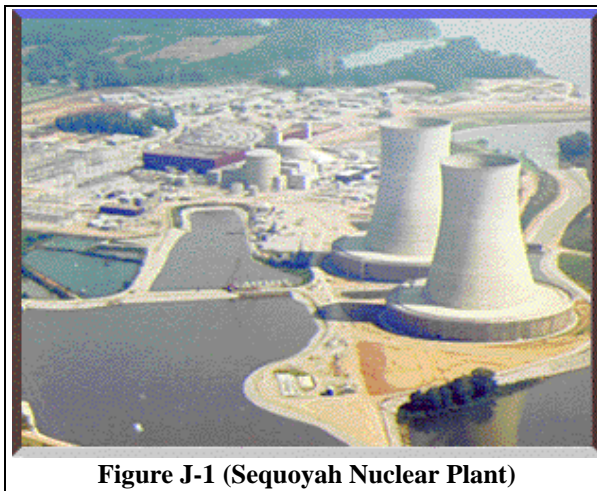
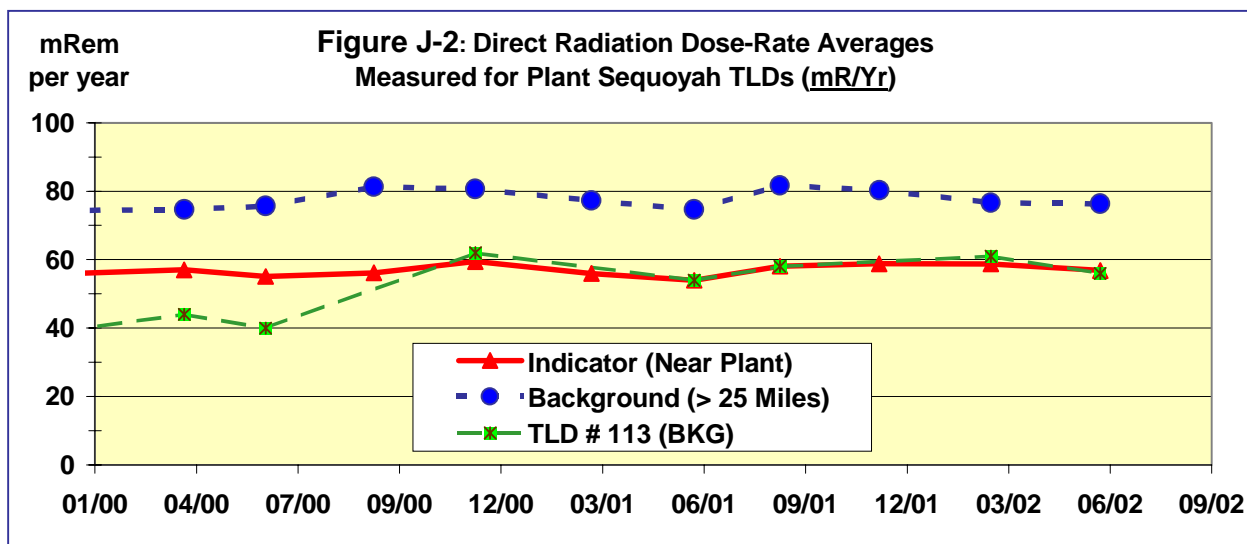


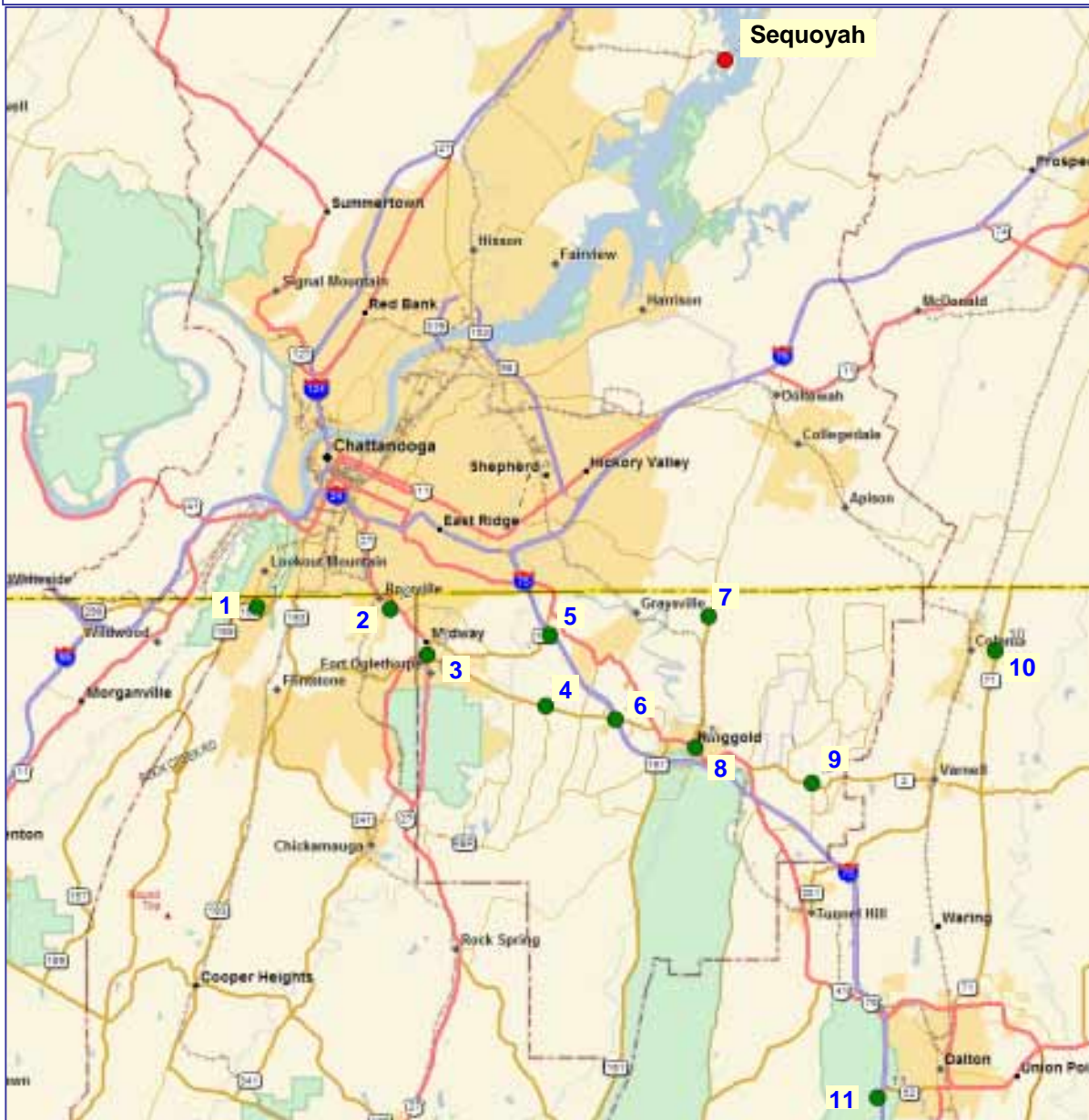
Figure J-1 (Sequoyah Nuclear Plant)

Several TLD and sample locations (**Figure J-3**) are included in DNR's network, with most of the monitoring focused on the northwest corner of Georgia, between Rock City, Rossville Ringold, and Cohutta. DNR has monitored Plant Sequoyah since approximately 1980, with no detectable Site-related activity. However, several man-made global-fallout-related radionuclides (including Nb-95, Zr-95, Ru-103, Ru-106, Ce-141, Ce-144, and Cs-137) were detected many years ago (1981) during the Chinese weapons testing period. Global fallout-related Cs-137 is the only man-made radionuclide that is still detectable.

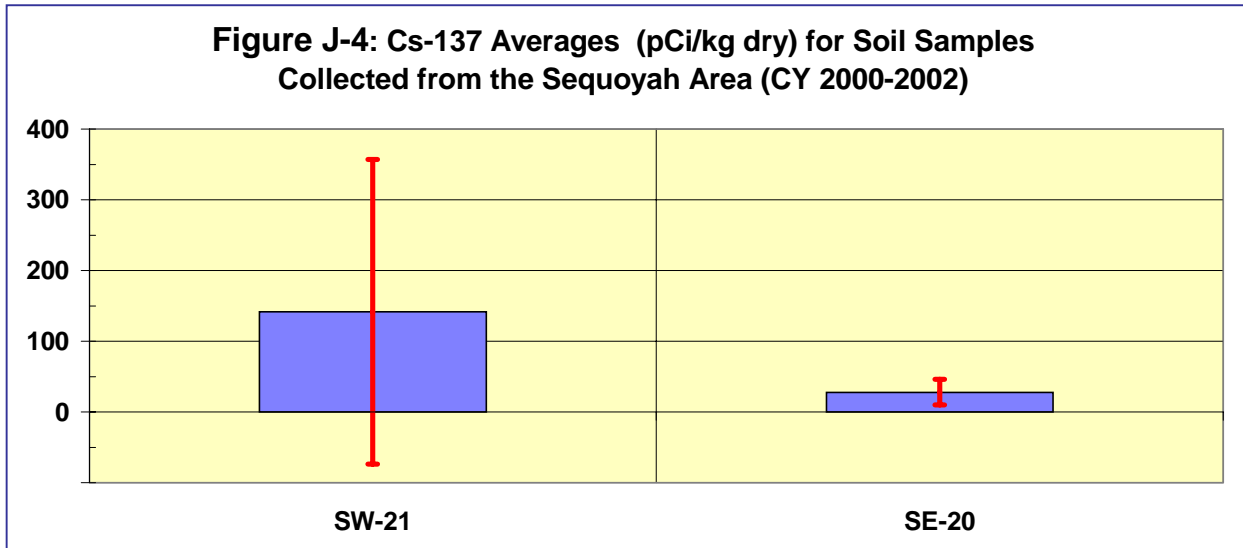
Direct Radiation (TLDs): Direct radiation doses (**Table J-1**), as measured by TLDs (Thermo-Luminescent Dosimeters) were within the normal (expected) range, with indicator locations (near Plant Sequoyah) measuring less than background (or control) locations (**Figure J-2**). No measurable offsite doses from Site operations were detected. Based on a review of soil sample results, naturally occurring radionuclides in the Uranium, Thorium, and Potassium series appear to account for over 99% of the direct radiation dose recorded on the TLDs, with fallout-related Cs-137 contributing the remainder. Indicator and background locations showed similar seasonal variability, which is attributed to seasonal variations in naturally occurring airborne radon. The direct radiation level at one background location (TLD # 113) did increase slightly (step-wise) after June 2000. This change is not attributed to Site operations, since the TLD is over 90 miles from the Site. Instead, this stepwise change is more likely to have been caused by construction-related activity involving the use of certain materials (such as concrete or gravel) which often contain naturally occurring radionuclides.



**Figure J-3: Sequoyah Land-Based Sample and TLD Locations
(TLDs, Soil, Vegetation, and Groundwater)**



Soil Samples: Soil sample results (**Table J-2**) were normal with no detectable manmade radionuclides except for Cs-137, which is usually attributable to global fallout, rather than Plant operations. Naturally occurring radionuclides (Ra-226, Ra-228, K-40, and progeny) were also detected and accounted for most of the activity in the samples. Cs-137 results (**Figure J-4**) were generally comparable (within the error-bar range) for both locations, but more variability was observed at the SW-21 sample location.



Ground Water: No man-made radionuclides were detected (**Table J-3**) in ground water samples. Low-level beta activity (usually attributable to naturally occurring radionuclides, such as K-40 and Ra-228) were detected at two locations, but weren't attributed to Site operations.

Vegetation: Vegetation samples (**Table J-4**) were also normal, with no man-made activity attributable to Plant operations. Naturally occurring Be-7 and K-40 were found in most samples. Global fallout-related Cs-137 was non-detectable in all samples.

Table J-1 Sequoyah Nuclear Plant TLD Dosimetry Data (mRem per Year)

Sta	Type	Dir	Dis	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	mR/Yr	
				12/1/99	3/21/00	6/2/00	9/7/00	12/7/00	3/21/01	6/21/01	9/6/01	12/4/01	3/14/02	6/20/02
1	I	SW	21	50	51	46	45	50	48	47	50	49	50	48
2	I	SW	20	47	50	46	47	50	48	44	46	46	48	45
3	I	SW	21	54	51	52	50	57	51	48	51	54	53	51
4	I	SSW	21	70	65	64	68	69	61	62	66	65	64	66
5	I	SSW	19	51	50	50	51	56	51	51	49	51		49
6	I	SW	20	43	48	45	43	50	44	41	44	46		44
7	I	S	18	62	62	60	62	63	56	59	61	61	57	60
8	I	S	20	61	57	60	59	63	59	58	60	62	60	58
9	I	SSE	20	70	72	66	72		69	68	71	75	69	72
10	I	SE	20	40	55	53	53	67	63	62	66	67	60	67
11	B	SSE	33	66	66	64	68	70	66		75	71	68	65
113	B	SSE	95	39	44	40		62		54	58		61	56
114	B	SSE	75	92	92	93	101	97	95	89	100	97	91	96
115	B	SSE	60	80	79	81	84	85	81	83	88	86	85	78
116	B	SSE	50	51	53	53	59	60	56	52	57	58	54	55

Note: Results for TLD # 113 (on Barrett Parkway near Kennesaw ...background) appear to have changed (increased stepwise) after 6/2/2000. This may be due to construction-related activity, which often involves the use of materials, such as concrete or gravel, which may contain naturally occurring radioactive materials.

Table J-2 Sequoyah Nuclear Plant Soil Sample Data (pCi/Kg dry)

Sta	Samp	Collect	Agy	DW	Cs-137	K-40 (nat)	Ra-226 (nat)	Ra-228 (nat)
<u>SW - 21 miles ... Fort Oglethorpe</u>								
8	329	3/21/2000	EPD	0.83	390	2,700	800	900
8	343	3/21/2001	EPD	0.81	<10	3,400	800	900
8	352	3/14/2002	EPD	0.88	25	4,600	600	700
<u>SE - 20 miles ... Cohutta</u>								
10	330	3/21/2000	EPD	0.78	26	6,300	500	600
10	344	3/21/2001	EPD	0.78	47	8,800	900	1,300
10	353	3/14/2002	EPD	0.75	11	7,400	800	1,000

Note: **Highlighted** Cs-137 data in sample # 329 appears to be out of range (elevated) compared to the rest of the data, but it is characteristic of old global fallout, since Cs-134 wasn't detected.

Table J-3 Sequoyah Nuclear Plant Groundwater Data (pCi/L)

Sta	Samp	Collect	Agy	Alpha	Beta	Cs-137	H-3
<u>SW - 21 miles ... Fort Oglethorpe</u>							
3	327	03/21/2000	EPD	<2	2	<5	<200
3	337	09/07/2000	EPD	<1	3	<5	<200
3	341	03/21/2001	EPD	<2	5	<5	<200
3	354	03/14/2002	EPD	<2	3	<5	<200
<u>SE - 20 miles ... Cohutta</u>							
10	328	03/21/2000	EPD	<1	2	<5	<200
10	338	09/07/2000	EPD	<1	3	<5	<200
10	342	03/21/2001	EPD	<1	3	<5	<200
10	355	03/14/2002	EPD	<1	<2	<5	200

Table J-4 Sequoyah Nuclear Plant Vegetation Sample Data (pCi/Kg fresh)

Sta	Samp	Collect	Agy	DW	Cs-137	Be-7 (nat)	K-40 (nat)
<u>SW - 21 miles ... Fort Oglethorpe</u>							
3	325	12/01/1999	EPD	0.23	<14	1,300	5,300
3	331	03/21/2000	EPD	0.16	<13	1,200	5,700
3	333	06/02/2000	EPD	0.22	<11	600	8,400
3	335	09/07/2000	EPD	0.13	<12	1,000	4,000
3	339	12/07/2000	EPD	0.32	<16	3,200	7,900
3	345	03/21/2001	EPD	0.18	21	1,000	6,200
3	347	06/21/2001	EPD	0.26	<13	700	5,800
3	349	09/06/2001	EPD	0.30	<18	900	5,700
3	356	06/20/2002	EPD	0.51	<15	1,500	12,000
3	358	12/05/2002	EPD	0.24	<12	2,600	3,100
<u>SE - 20 miles ... Cohutta</u>							
10	326	12/01/1999	EPD	0.34	<20	400	8,100
10	332	03/21/2000	EPD	0.24	<19	3,800	7,100
10	334	06/02/2000	EPD	0.28	<11	600	4,200
10	336	09/07/2000	EPD	0.24	<15	700	6,100
10	340	12/07/2000	EPD	0.31	<19	3,800	8,800
10	346	03/21/2001	EPD	0.21	<15	1,700	6,400
10	348	06/21/2001	EPD	0.21	<13	500	8,400
10	350	09/06/2001	EPD	0.18	<15	1,200	6,000
10	351	12/04/2001	EPD	0.23	<12	1,600	6,600
10	357	06/20/2002	EPD	0.44	<13	750	8,800
10	359	12/05/2002	EPD	0.20	<10	2,000	4,800