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February 27,
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Addressees - Letter dated February 27, 1986

SUBJECT: OAK RIDGE ENVIRONMENTAL DATA -- JANUARY 1986

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#460

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Oak Ridge Operations
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February 27, 1986

Those on Attached List

Gentlemen:

OAK RIDGE ENVIRONMENTAL DATA -- JANUARY 1986

Additional mercury data have been generated for the Oak Ridge area and are enclosed for your information.

During this reporting period the soil sampling and analysis work were completed on the Royce Circle property. A total of eight soil cores were collected and divided for separate analysis. The analytical results are shown in Table 1. This property is largely in the East Fork Poplar Creek floodplain and is also traversed by the main sewerline which has in part received floodplain soil cover. For purposes of perspective, Table 2 is included which shows background concentrations in soil taken from an uncontaminated Oak Ridge site.

If there are any questions related to this information, please contact me at (615) 576-1256 or (FTS) 626-1256.

Sincerely,

Wayne Hibbitts
Office of Assistant Manager
for Safety and Environment

SE-30:Hibbitts

Enclosure:
As Stated

cc w/encl.:
Oak Ridge Library
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TABLE 1

MULTI-PARAMETER ANALYSIS FOR
SOIL CORES FROM ROYCE CIRCLE PROPERTY

Log No. Depth in.	85-1238A 0-7.6 (ppm)	85-1238B 7.6-11.8 (ppm)	85-1238C 11.8-13.2 (ppm)
ARSENIC	5.6 ± 0.4	12. ± 1.	8.7 ± 0.6
BARIUM	350. ± 20.	480. ± 40.	380. ± 40.
BERYLLIUM	<1.	<1.	<1.
CADMIUM	1.6	6.1	3.1
CHROMIUM	55. ± 3.	83. ± 5.	66. ± 4.
COPPER	26.	110.	47.
LEAD	48.	110.	45.
LITHIUM	8.	20.	10.
MERCURY	13. ± 1.	170. ± 10.	30. ± 2.
NICKEL	22.	60.	27.
SELENIUM	<1.	<2.	<3.
SILVER	<1.	8.0 ± 0.9	<2.
THORIUM	10.4 ± 0.6	23. ± 1.	13. ± 1.
URANIUM	9.0 ± 0.6	28. ± 2.	20. ± 1.
ZINC	100. ± 7.	170. ± 10.	90. ± 9.
ANTIMONY	0.80 ± .08	1.2 ± 0.1	1.0 ± 0.1
BROMINE	5.9 ± 0.4	6.4 ± 0.5	3.4 ± 0.4
CERIUM	80. ± 5.	100. ± 6.	100. ± 6.
GALLIUM	11. ± 1.	15. ± 1.	13. ± 1.
HAFNIUM	11. ± 1.	12. ± 1.	20. ± 1.
IODINE	6.5 ± 1.5	6.4 ± 1.8	<2.
LANTHANUM	32. ± 2.	37. ± 2.	34. ± 2.
THALLIUM			
TUNGSTEN	1.9 ± 0.2	5.4 ± 0.4	2.2 ± 0.3
VANADIUM	54. ± 4.	84. ± 6.	66. ± 4.

TABLE 1 (Continued)

	Log No. Depth in.	85-1239A 0 - 8.3 (ppm)	85-1239B 8.3 - 14.3 (ppm)	85-1239C 14.3 - 15.5 (ppm)	85-1239D 15.5 - 22 (ppm)
ARSENIC		7.1 ± 0.5	11.5 ± 0.7	12.1 ± 0.7	8.0 ± 0.5
BARIUM		420. ± 30.	500. ± 40.	640. ± 50.	350. ± 20.
BERYLLIUM		1.2	<2.	<1.	<1.
CADMIUM		3.4	7.2	14.	4.3
CHROMIUM		100. ± 6.	79. ± 5.	76. ± 5.	60. ± 4.
COPPER		70.	70.	48.	74.
LEAD		140.	88.	93.	40.
LITHIUM		12.	18.	30.	9.
MERCURY		46. ± 2.	170. ± 10.	650. ± 40.	30. ± 2.
NICKEL		49.	86.	94.	25.
SELENIUM		1.1 ± 0.6	<2.	<3.	<2.
SILVER		7.0 ± 0.6	12. ± 1.	6.7 ± 0.9	<1.
THORIUM		20. ± 1.	21. ± 1.	33. ± 2.	12. ± 1.
URANIUM		25. ± 2.	38. ± 2.	33. ± 2.	24. ± 2.
ZINC		190. ± 15.	150. ± 10.	120. ± 10.	100. ± 10.
ANTIMONY		0.8 ± 0.8	1.1 ± 0.1	1.0 ± 0.1	0.9 ± 0.1
BROMINE		7.6 ± 0.5	7.2 ± 0.5	6.1 ± 0.5	3.9 ± 0.3
CERIUM		88. ± 5.	100. ± 6.	110. ± 7.	92. ± 5.
GALLIUM		12. ± 1.	15. ± 1.	14. ± 1.	15. ± 1.
HAFNIUM		12. ± 1.	12. ± 1.	12. ± 1.	28. ± 2.
IODINE		<2.	7.0 ± 1.7	11. ± 2.	<2.
LANTHANUM		31. ± 2.	38. ± 2.	37. ± 2.	92. ± 5.
THALLIUM					
TUNGSTEN		6.4 ± 0.4	6.3 ± 0.4	2.2 ± 0.2	1.6 ± 0.2
VANADIUM		59. ± 4.	78. ± 5.	78. ± 5.	65. ± 4.

TABLE 1 (Continued)

Log No. Depth in.	85-1240A 0 - 7.8 (ppm)	85-1240B 7.8 - 13.0 (ppm)	85-1240C 13.0 - 16.0 (ppm)	85-1240D 16.0 - 21.0 (ppm)
ARSENIC	7.1 ± 0.4	11. ± 0.7	10. ± 0.6	6.8 ± 0.4
BARIUM	360. ± 30.	480. ± 40.	550. ± 40.	310. ± 20.
BERYLLIUM	<1.	1.6	1.1	<1.
CADMIUM	3.5	9.3	4.3	2.5
CHROMIUM	92. ± 5.	76. ± 5.	74. ± 5.	48. ± 3.
COPPER	76.	120.	96.	63.
LEAD	109.	95.	74.	44.
LITHIUM	12.	23.	15.	9.
MERCURY	50. ± 3.	330. ± 20.	290. ± 20.	18. ± 1.
NICKEL	78.	84.	22.	19.
SELENIUM	<1.	<2.	<2.	<1.
SILVER	6.2 ± 0.5	11. ± 1.	5.0 ± 0.7	<1.
THORIUM	17. ± 1.	28. ± 2.	17. ± 1.	8.6 ± 0.5
URANIUM	25. ± 2.	40. ± 2.	22. ± 2.	20. ± 1.
ZINC	170. ± 10.	130. ± 10.	115. ± 10.	150. ± 10.
ANTIMONY	0.73 ± .05	1.2 ± 0.1	0.9 ± 0.1	1.2 ± 0.1
BROMINE	6.5 ± 0.4	7.2 ± 0.5	7.6 ± 0.5	2.9 ± 0.2
CERIUM	84. ± 5.	100. ± 6.	100. ± 6.	77. ± 5.
GALLIUM	12. ± 1.	15. ± 1.	14. ± 1.	10. ± 1.
HAFNIUM	11. ± 1.	11. ± 1.	14. ± 1.	17. ± 1.
IODINE	8.0 ± 1.6	12. ± 2.	12. ± 1.	<2.
LANTHANUM	31. ± 2.	36. ± 2.	35. ± 2.	28. ± 2.
THALLIUM				
TUNGSTEN	5.3 ± 0.4	5.1 ± 0.4	2.6 ± 0.2	1.3 ± 0.1
VANADIUM	58. ± 4.	76. ± 5.	60. ± 4.	61. ± 4.

TABLE 1 (Continued)

Log. No. Depth in.	85-1241A 0 - 4.0 (ppm)	85-1241B 4.0 - 9.5 (ppm)	85-1241C 9.5 - 11.5 (ppm)
ARSENIC	5.2 ± 0.3	11. ± 0.7	7.3 ± 0.5
BARIUM	350. ± 30.	500. ± 50.	340. ± 30.
BERYLLIUM	<1.	1.3	<1.
CADMIUM	<1.	6.3	2.9
CHROMIUM	47. ± 3.	86. ± 5.	54. ± 3.
COPPER	48.	180. ± 50.	116.
LEAD	38.	91.	10.
LITHIUM	5.4	18.	7.
MERCURY	13. ± 1.	190. ± 10.	8.9 ± 0.7
NICKEL	18.	59.	17.
SELENIUM	<2.	<2.	<2.
SILVER	1.3 ± 0.3	7.9 ± 0.8	1.6 ± 0.5
THORIUM	10. ± 1.	23. ± 1.	10. ± 1.
URANIUM	8.7 ± 0.7	35. ± 2.	20. ± 1.
ZINC	80. ± 6.	180. ± 15.	100. ± 8.
ANTIMONY	0.3 ± 0.1	1.1 ± 0.1	0.8 ± 0.1
BROMINE	4.1 ± 0.3	6.3 ± 0.5	3.3 ± 0.3
CERIUM	80. ± 5.	100. ± 6.	95. ± 6.
GALLIUM	11. ± 1.	17. ± 1.	12. ± 1.
HAFNIUM	11. ± 1.	12. ± 1.	22. ± 1.
IODINE	<2.	11. ± 2.	<2.
LANTHANUM	32. ± 2.	37. ± 2.	32. ± 2.
THALLIUM			
TUNGSTEN	2.0 ± 0.2	5.5 ± 0.4	1.3 ± 0.2
VANADIUM	47. ± 3.	76. ± 5.	69. ± 4.

TABLE 1 (Continued)

Log. No. Depth in.	85-1242A 0 - 7.9 (ppm)	85-1242B 7.9 - 15.8 (ppm)	85-1242C 15.8 - 18.8 (ppm)	85-1242D 18.8 - 24.0 (ppm)
ARSENIC	6.9 ± 0.4	5.4 ± 0.4	9.2 ± 0.6	6.3 ± 0.4
BARIUM	460. ± 30.	460. ± 30.	370. ± 30.	310. ± 20.
BERYLLIUM	1.0	1.6	<1.	<1.
CADMIUM	4.6	9.6	7.5	7.8
CHROMIUM	81. ± 5.	68. ± 4.	63. ± 4.	48. ± 3.
COPPER	71.	130.	72.	50.
LEAD	110.	77.	73.	38.
LITHIUM	13.	22.	20.	7.8
MERCURY	57. ± 4.	320. ± 20.	250. ± 15.	3.8 ± 0.3
NICKEL	43.	60.	57.	18.
SELENIUM	<2.	1.0 ± 0.5	<2.	<1.
SILVER	5.7 ± 0.6	8.9 ± 0.8	3.2 ± 0.7	<1.
THORIUM	14. ± 1.	22. ± 1.	15. ± 1.	8.4 ± 0.5
URANIUM	24. ± 1.	29. ± 2.	23. ± 1.	18. ± 1.
ZINC	150. ± 10.	100. ± 8.	120. ± 10.	50. ± 4.
ANTIMONY	0.8 ± 0.1	0.9 ± 0.1	0.9 ± 0.1	0.7 ± 0.1
BROMINE	7.2 ± 0.5	5.4 ± 0.4	4.5 ± 0.4	2.8 ± 0.2
CERIUM	83. ± 5.	98. ± 6.	97. ± 6.	83. ± 5.
GALLIUM	11. ± 1.	12. ± 1.	13. ± 1.	11. ± 1.
HAFNIUM	12. ± 1.	13. ± 1.	24. ± 2.	19. ± 1.
IODINE	4.7 ± 1.5	5.5 ± 1.4	4.8 ± 1.4	<2.
LANTHANUM	29. ± 2.	33. ± 2.	34. ± 2.	28. ± 2.
THALLIUM				
TUNGSTEN	4.4 ± 0.3	3.3 ± 0.3	1.9 ± 0.2	1.1 ± 0.1
VANADIUM	59. ± 4.	70. ± 4.	70. ± 4.	59. ± 4.

TABLE 1 (Continued)

Log No. / Depth in.	85-1243A 0 - 7.3 (ppm)	85-1243B 7.3 - 13.0 (ppm)
ARSENIC	6.6 ± 0.4	12. ± 1.
BARIUM	370. ± 30.	400. ± 40.
BERYLLIUM	<1.	<1.
CADMIUM	3.8	6.2
CHROMIUM	85. ± 5.	78. ± 5.
COPPER	66.	120.
LEAD	120.	100.
LITHIUM	11.	23.
MERCURY	40. ± 3.	320. ± 20.
NICKEL	40.	64.
SELENIUM	<2.	<2.
SILVER	5.4 ± 0.5	6.7 ± 0.8
THORIUM	13. ± 1.	25. ± 2.
URANIUM	25. ± 1.	32. ± 2.
ZINC	140. ± 10.	110. ± 10.
ANTIMONY	0.70 ± .05	1.2 ± 0.1
BROMINE	6.3 ± 0.4	7.3 ± 0.5
CERIUM	79. ± 4.	97. ± 6.
GALLIUM	10. ± 1.	14. ± 1.
HAFNIUM	11. ± 1.	11. ± 1.
IODINE	<2.	<2.
LANTHANUM	28. ± 2.	37. ± 2.
THALLIUM		
TUNGSTEN	4.3 ± 0.3	4.7 ± 0.3
VANADIUM	57. ± 4.	77. ± 5.

TABLE 1 (Continued)

Log No. / Depth in.	85-1244A 0 - 9.3 (ppm)	85-1244B 9.3 - 14 (ppm)	85-1244C 14 - 25 (ppm)	85-1244D 25 - 28.8 (ppm)
ARSENIC	6.2 ± 0.4	9.5 ± 0.6	9.2 ± 0.6	6.8 ± 0.4
BARIUM	370. ± 30.	520. ± 40.	460. ± 30.	350. ± 20.
BERYLLIUM	<1.	<1.	<1.	<1.
CADMIUM	6.4	14.	12.	13.
CHROMIUM	96. ± 6.	67. ± 4.	59. ± 4.	63. ± 4.
COPPER	65.	100.	76.	90.
LEAD	100.	72.	67.	73.
LITHIUM	11.	21.	23.	18.
MERCURY	52. ± 3.	320. ± 20.	530. ± 30.	190. ± 10.
NICKEL	50.	67.	62.	70.
SELENIUM	<1.	<2.	<2.	<1.
SILVER	5.5 ± 0.4	11. ± 1.	3.0 ± 0.5	3.7 ± 0.4
THORIUM	13. ± 1.	20. ± 1.	16. ± 1.	11. ± 1.
URANIUM	20. ± 1.	35. ± 2.	20. ± 1.	18. ± 1.
ZINC	160. ± 10.	100. ± 8.	100. ± 8.	110. ± 8.
ANTIMONY	0.63 ± .04	1.0 ± 0.1	0.9 ± 0.1	0.82 ± .06
BROMINE	5.8 ± 0.4	6.2 ± 0.4	4.7 ± 0.4	4.1 ± 0.3
CERIUM	78. ± 5.	94. ± 6.	88. ± 5.	84. ± 5.
GALLIUM	10. ± 1.	13. ± 1.	11. ± 1.	11. ± 1.
HAFNIUM	13. ± 1.	13. ± 1.	12. ± 1.	33. ± 2.
IODINE	<2.	11. ± 2.	<2.	<2.
LANTHANUM	28. ± 2.	33. ± 2.	30. ± 2.	29. ± 2.
THALLIUM				
TUNGSTEN	4.1 ± 0.3	4.8 ± 0.3	1.6 ± 0.2	1.4 ± 0.2
VANADIUM	45. ± 3.	73. ± 5.	64. ± 4.	64. ± 4.

TABLE 1 (Continued)

Log No. / Depth in.	85-1245A 0 - 6.5 (ppm)	85-1245B 6.5 - 10.8 (ppm)	85-1245C 10.8 - 12.5 (ppm)
ARSENIC	7.2 ± 0.4	12. ± 1.	8.3 ± 0.5
BARIUM	420. ± 30.	530. ± 40.	370. ± 30.
BERYLLIUM	1.4	1.3	<1.
CADMIUM	3.7	12.	3.8
CHROMIUM	84. ± 5.	73. ± 5.	65. ± 4.
COPPER	56.	75.	38.
LEAD	120.	96.	44.
LITHIUM	11.	22.	7.
MERCURY	52. ± 3.	530. ± 30.	10. ± 1.
NICKEL	36.		22.
SELENIUM	<2.	<3.	<2.
SILVER	5.2 ± 0.6	7.0 ± 1.1	<1.
THORIUM	15. ± 1.	31. ± 2.	12. ± 1.
URANIUM	20. ± 1.	20. ± 1.	10. ± 1.
ZINC	170. ± 10.	120. ± 10.	120. ± 10.
ANTIMONY	0.89 ± .09	1.2 ± 0.1	0.9 ± 0.1
BROMINE	6.8 ± 0.5	9.4 ± 0.6	4.0 ± 0.4
CERIUM	82. ± 5.	110. ± 6.	96. ± 5.
GALLIUM	11. ± 1.	13. ± 1.	15. ± 1.
HAFNIUM	12. ± 1.	12. ± 1.	30. ± 2.
IODINE	<2.	12. ± 2.	<2.
LANTHANUM	32. ± 2.	38. ± 2.	37. ± 2.
THALLIUM			
TUNGSTEN	4.3 ± 0.3	3.3 ± 0.3	<1.
VANADIUM	58. ± 4.	80. ± 5.	76. ± 5.

TABLE 2

ORAU HOTEL SITE SOILS:PROFILE
Results in ppm unless otherwise noted

ELEMENT	84-2431	84-2432	84-2433	84-2434	84-2435	84-2436	84-2437
Li	8.0	9.0	9.0	2.0	2.5	2.5	3.5
Be	0.90	0.75	0.85	0.75	0.45	0.40	0.60
Na (%)	0.23	0.24	0.25	0.09	0.10	0.10	0.10
Mg (%)	0.53						
Al (%)	6.2	6.9	7.1	4.9	5.6	5.6	6.1
K (%)	1.8	1.9	2.0	1.0	1.2	1.2	1.0
Sc	13.	13.	14.	7.9	10.	10.	10.
Ti (%)	0.58	0.67	0.64	0.68	0.71	0.73	0.66
V	92.	100.	110.	70.	94.	84.	84.
Cr	70.	70.	74.	45.	55.	56.	56.
Mn	910.	920.	1070.	4200.	3800.	4300.	5400.
Fe (%)	3.3	3.5	3.5	2.6	3.4	3.3	3.3
Co	16.	16.	18.	17.	20.	22.	20.
Ni	25.	28.	31.	24.	25.	30.	35.
Cu	13.	16.	17.	9.	8.	8.	11.
Zn	90.	110.	150.	100.	100.	110.	120.
As	6.7	7.9	6.6	6.6	7.8	8.4	8.2
Se	<1.	<1.	<1.	<1.	<1.	<1.	<1.
Br	7.9	8.8	8.3	5.9	3.8	4.0	4.7
Rb	100.	120.	120.	72.	90.	92.	92.
Sr	75.			70.			
Zr	415.	330.	300.	440.	550.	520.	500.
Ag	<1.	<1.	<1.	<1.	<1.	<1.	<1.
Cd	2.3	2.1	2.0	1.6	3.0	1.6	3.0
Sb		0.8	0.5	0.7	0.7	0.7	0.9
Cs	4.0	4.5	4.4	2.9	3.8	3.8	4.0
Ba	560.	560.	590.	360.	470.	480.	480.
La	43.	45.	47.	46.	50.	50.	55.
Ce	93.	97.	100.	100.	120.	120.	130.
Hf	9.7	9.1	9.3	12.	13.	14.	13.
Hg	0.08	0.07	0.02	0.21	0.08	0.05	0.09
Pb	23.	21.	23.	44.	37.	32.	34.
Th	11.	12.	12.	11.	13.	14.	13.
U	4.	3.	4.7	3.	3.0	3.4	2.5
PCB	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MHg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1