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November 9, 1989

Alice Lay,

RECORD COPY

CERCLA Reportable Quantity Exceedances for Radiological EffluentsH13-1.2
89: 00040

In Marianne Heiskell's letter to Waldo Golliher dated October 30, 1989 a request was made to report on discharges containing radiological contaminants. The criteria for reporting was that the radiological content of the effluent exceeded one pound during a 24 hour period and the effluent not be covered by a federal permit. The standards for radiological reportable quantities (RQ) was revised in May 1989 and our effluents are compared to these standards and the DOE Derived Concentration Guides (DCG) in this review. DCG's are utilized to prevent a 25 mrem/yr dose to the general public.

All NPDES discharges are specifically covered by a state permit which are classified as meeting the federal exemption. A copy of the state certification letter that addresses radiological effluents and which accompanies the NPDES permit is enclosed. No daily reportable quantity review is required.

When compared to the present CERCLA reportable quantities, the NPDES discharges are at or below the standard even if the entire annual discharge quantity is compared to the 24 hour limitation. All NPDES effluents are typically below the DOE DCG as indicated by data from the 1988 Environmental Surveillance Report (enclosed).

The only discharge that warrants review other than the NPDES permitted discharges is the K-722 contaminated scrap metal yard. When compared to the 1 pound reportable quantity, this facility exceeded the limitation 48 times from January 1, 1989 to July 20, 1989. Enclosed in attachment 3 is the individual loading on individual days that exceeded the RQ. The loading were calculated by assuming that all rain during the 24 hour period over the entire 50 acres flowed offsite and that none infiltrated the soil or evaporated. The volume of rain water is then multiplied by the concentration or radiological activity of a representative sample. Analysis for all isotopes are given in activity except uranium which is given in mg/L. All surface water that flows offsite at K-722 discharges to the Clinch River and is directly related to rainfall.

The calender year 1988 entire annual radiological discharge quantities are compared to the new reportable quantities, which address a 24 hour period in attachment 4. Only one annual value approaches the 24 hour RQ which indicates that daily RQ's are not exceeded. The discharges are also compared to the DCG established by DOE. The DCG was reached by the uranium - 234 isotope for this discharge. This area will be addressed as a CERCLA site by the K-25 Remedial Action Program.

APPROVAL FOR RELEASE

Bill Scheib

Document: # Unnumbered ; Date 11/9/89 ;
 Title/Subject Ltr., Bill Scheib to Alice Lay, "CERCLA Reportable Quantity Exceedances for Radiological Effluents and attachments"

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Title: CERCLA Reportable Quantity Exceedances for Radionuclides Effluents
Authors: A. Lay
Abstract: Reports 1988 annual radiological discharge quantities in effluent
from K-25 facilities, including K-722 scrap metal yard, K-1203,
K-1700, K-1007, and K-901A.
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Plutonium, Neptunium, Radionuclides

K-722 Contaminated Scrap Metal Yard

Reportable Quantity Comparison

<u>Isotope</u>	<u>h Reportable Quantity</u>	<u>Yearly discharge</u>
Uranium-234	.1 Ci	.061 - 0.138 Ci
Uranium-235	.1 Ci	0.00553 Ci
Uranium-236	.1 Ci	0.00162 Ci
Uranium-238	.1 Ci	0.0667 Ci
Technetium-99	10 Ci	0.217 0.163 Ci
Cesium	1 Ci	ND ¹
Plutonium	.01 Ci	ND
Neptunium	10 Ci	ND

Derived Concentration Guide Comparison

<u>Isotope</u>	<u>Derived Concentration Guide</u>	<u>✓ Yearly discharge</u>
Uranium-234	500 pCi/L	223 → 507 pCi/L
Uranium-235	600 pCi/L	720 pCi/L
Uranium-236	500 pCi/L	5 pCi/L
Uranium-238	600 pCi/L	246 pCi/L
Technetium-99	100,000 pCi/L	600 pCi/L
Cesium	3,000 pCi/L	ND ¹
Plutonium	30 pCi/L	ND
Neptunium	30 pCi/L	ND

1. ND - None detected

Scrap Metal Yard Discharges
Above 1 lb Reportable Quantity
January 1 - July 20, 1989

<u>Date</u>	<u>Rainfall (inches)</u>	<u>Uranium (pounds)</u>
1/6/89	.69	3.5
1/8/89	.79	4.0
1/11/89	1.15	5.8
1/12/89	1.50	7.6
1/13/89	.36	1.8
1/14/89	.35	4.3
1/30/89	.52	2.6
2/5/89	.48	2.4
2/6/89	.50	2.5
2/14/89	.47	2.4
2/18/89	.22	1.1
2/20/89	.32	1.6
2/21/89	.98	5.0
2/27/89	.71	3.6
3/4/89	.27	1.4
3/5/89	2.76	13.9
3/6/89	.34	1.7
3/18/89	.46	2.3
3/20/89	.53	2.7
3/21/89	.21	1.1
3/23/89	.47	2.4
3/31/89	.84	4.2
4/3/89	.26	1.3
4/4/89	1.11	5.6
4/8/89	.41	2.1
4/30/89	.26	1.3
5/1/89	.40	2.0
5/4/89	.30	1.5
5/5/89	1.74	8.8
5/9/89	.40	2.0
5/10/89	.58	2.9
5/21/89	.94	4.8
5/27/89	1.75	8.8
6/5/89	.59	3.0
6/6/89	.37	1.9
6/8/89	.70	3.5
6/12/89	1.60	8.1
6/15/89	1.28	6.5
6/16/89	.48	2.4
6/19/89	1.52	2.7
6/20/89	2.26	11.4
6/28/89	.26	1.3

Scrapyard Discharges - Continue
Above 1 Lb Reportable Quantity
January 1 - July 20, 1989

<u>Date</u>	<u>Rainfall (inches)</u>	<u>Uranium (pounds)</u>
7/2/89	.23	1.2
7/3/89	1.03	5.2
7/6/89	.64	3.2
7/11/89	.64	3.2
7/12/89	1.05	5.3
7/19/89	.39	2.0

WJS
11/9/89

Table 2.2.25. 1988 ORGDP radiological effluent at K-1203

Radionuclide	Emission source (Ci)	DCG ^a (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
⁹⁹ Tc	9.77×10^{-3}	100,000	16.8	0.02
²³⁴ U	1.83×10^{-3}	500	3.14	0.63
²³⁵ U	3.15×10^{-4}	600	0.54	0.09
²³⁶ U	2.57×10^{-5}	500	4.4×10^{-2}	3.8×10^{-3}
²³⁸ U	1.06×10^{-3}	600	1.82	0.30

^aDerived concentration guide.

Table 2.2.26. 1988 ORGDP radiological effluent at K-1700

Radionuclide	Emission source (Ci)	DCG ^a (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
²³⁷ Np	3.78×10^{-5}	30	0.05	0.17
²³⁹ Pu	1.80×10^{-3}	30	2.26	8.0
⁹⁹ Tc	6.69×10^{-2}	100,000	83.9	0.08
¹³⁷ Cs	2.67×10^{-4}	3,000	0.33	0.01
²³⁴ U	2.77×10^{-2}	500	4.62×10^{-5}	9.2×10^{-6}
²³⁵ U	1.32×10^{-3}	600	1.66	0.28
²³⁶ U	2.83×10^{-4}	500	0.36	0.07
²³⁸ U	2.56×10^{-3}	600	32.1	5.4

^aDerived concentration guide.

Table 2.2.27. 1988 ORGDP radiological effluent at K-1007

Radionuclide	Emission source (Ci)	DCG ^a (pCi/L)	Average concentration (pCi/L)	Percentage of DCG
²³⁷ Np	1.67×10^{-5}	30	8.29×10^{-3}	0.03
²³⁹ Pu	8.90×10^{-5}	30	4.55×10^{-2}	0.15
⁹⁹ Tc	3.99×10^{-2}	100,000	20.4	0.02
¹³⁷ Cs	0	3,000	b	b
²³⁴ U	4.92×10^{-3}	500	2.52	0.50
²³⁵ U	1.32×10^{-4}	600	6.75×10^{-2}	0.01
²³⁶ U	3.50×10^{-5}	500	1.79×10^{-2}	3.6×10^{-3}
²³⁸ U	1.40×10^{-3}	600	0.72	0.12

^aDerived concentration guide.^bNot applicable.

Table 2.2.28. 1988 ORGDP radiological effluent at K-901A

Radionuclide	Emission source (Ci)	DCG ^a (pCi/L)	Average concentration (pCi/L)	Percent DCG
²³⁷ Np	9.05×10^{-6}	30	2.29×10^{-2}	0.08
²³⁹ Pu	1.65×10^{-5}	30	4.17×10^{-2}	0.14
⁹⁹ Tc	1.31×10^{-2}	100,000	33.1	0.03
¹³⁷ Cs	0	3,000	b	b
²³⁴ U	1.76×10^{-3}	500	4.45	0.89
²³⁵ U	8.03×10^{-5}	600	0.20	0.03
²³⁶ U	2.06×10^{-5}	500	5.21×10^{-2}	0.01
²³⁸ U	8.57×10^{-4}	600	2.17	0.36

^aDerived concentration guide.

bNot applicable.

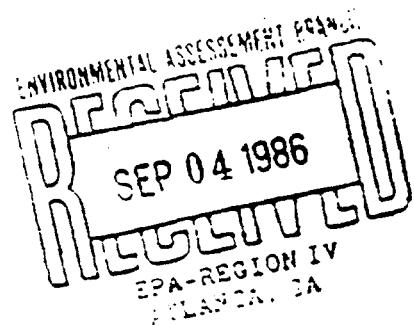


TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT

Bureau of Environment
T.E.R.R.A. BUILDING
150 NINTH AVENUE NORTH
NASHVILLE, TENNESSEE 37219-5404

August 19, 1986

Mr. Bruce R. Barrett, Director
Water Management Division, Region IV
Environmental Protection Agency
345 Courtland Street
Atlanta, Georgia 30365



RE: State Certification of Modifications to NPDES Permit No. TN 0002950
U. S. Department of Energy, Oak Ridge Operations
Oak Ridge Gaseous Diffusion Plant (K-25)
Roane County

Dear Mr. Barrett:

Pursuant to Section 401 of the Federal Water Pollution Control Act (as amended by the Clean Water Act of 1977), 33 U.S.C. 1251, 1341, the State of Tennessee hereby certifies the modifications to the National Pollutant Discharge Elimination System (NPDES) Permit referenced above.

The State of Tennessee is not aware of any condition or limitation under Section 301, Section 302, or Section 303 of the Federal Act that would be violated by issuance of the proposed NPDES Permit; additionally, the State of Tennessee is not aware of any standard of performance under Section 306 or Section 307 that would be violated by issuance of the proposed Permit.

This certification is contingent upon the following conditions:

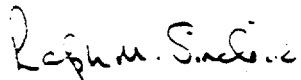
1. Permittee is in no way relieved from any liability for damages which might result from the discharge of wastewater.
2. Permittee must additionally comply with all requirements, conditions, or limitations which may be imposed by any provision of the Tennessee Water Quality Control Act (T.C.A. Sections 69-3-101 through 69-3-121) or any regulations promulgated pursuant thereto.
3. The State of Tennessee reserves the right to modify or revoke this certification or to seek revocation or modification of the NPDES Permit issued subject to this certification should the State determine that the wastewater discharge violates the Tennessee Water Quality Control Act, or any applicable Water Quality Criteria, or any rules or regulations which may be promulgated pursuant to the Clean Water Act of 1977, Public Law 95-217.

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1. Radioactivity in effluents from, to, and off shall be reduced to levels as low as reasonably achievable. At a minimum each discharge shall comply with the limitations in Schedule RHS 3-1, Table II, Column 2, of the Regulations of the Tennessee Department of Health and Environment, Chapter 1200-2-5. Limits are applicable at the point where the discharge enters the receiving stream. For purposes of this paragraph concentrations may not be averaged over any period exceeding one year, per Rule 1200-2-5-.08(1). A screening analysis for radioactivity shall be done monthly. If the results are greater than 3×10^{-3} $\mu\text{Ci}/\text{ml}$, then an isotope analysis shall be performed to identify specific nuclides present. Alternatively, the permittee may submit for approval a radiological monitoring plan to the Tennessee Department of Health and Environment.

Very truly yours,



Ralph M. Sinclair
Manager, Permits Section
Division of Water Pollution Control

RMS:NRH:pjl DWM2

cc: U. S. Department of Energy - Oak Ridge Operations, Environmental Protection Division
Knoxville Basin Office, Div. of Water Pollution Control