

DOCKET
40-8027



KERR-McGEE NUCLEAR CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

September 29, 1977

Mr. J.E. Rothfleisch
Fuel Processing and Fabrication Branch
Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Rothfleisch:

I am furnishing you the following information and attachments in response to your telephone requests of September 29, 1977.

I have compared the 1973 Oklahoma Water Quality Standards with the 1976 standards and they are identical with respect to the data shown in Table 6.2 (Reference #3) of your draft EIA dated September 16, 1977.

Attached is a copy of the USGS report data referenced as #5 to Table 6.2 of the EIA. Also attached is a copy of our new waste disposal permit #W.D.-75-074, and selected pages from the 1976 Water Quality Standards.

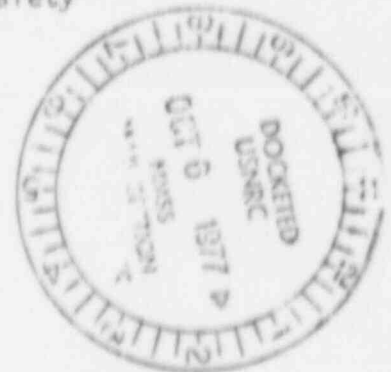
I hope this information will be useful to you.

Sincerely,

G.J. Sinke, Coordinator
Radiation Health and Safety

GJS:db

Attachments



6512200187 770929
PDR ADOCK 04008027
C PDR

07775

For Jack Rothfleisch

1974

**Water Resources Data
for
Oklahoma**

Part 2. Water Quality Records



**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Prepared in cooperation with the State of Oklahoma
and with other agencies

ARKANSAS RIVER BASIN

07246400 ROBERT S. KERR LOCK AND DAM (ARKANSAS RIVER) NEAR SALLISAW, OKLA.

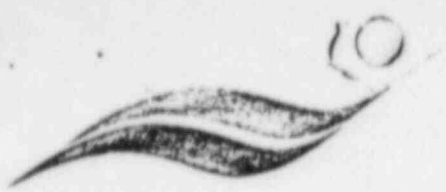
LOCATION.--Lat 35°21'57", long 94°46'43", in SE 1/4 SW 1/4 sec.8, T.10 N., R.24 E., Sequoyah County, from lock wall at dam, 0.4 mi (0.6 km) upstream from gage on bridge on U.S. Highway 59, 3.5 mi (5.6 km) downstream from Sans Bois Creek, 7.5 mi (12.1 km) south of Sallisaw, and at mile 395.4 (636.2 km).

DRAINAGE AREA.--147,750 mi² (382,672 km²), of which 21,241 mi² (57,604 km²) is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: December 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	DIS= SOLVED CAL= CIUM (CA) (MG/L)	DIS= SOLVED MAG= NE= SIUM (MG/L)	DIS= SOLVED SODIUM (NA) (MG/L)	BICAR= BONATE (HCO3) (MG/L)	CAN= BONATE (CO3) (MG/L)	ALKA= LINITY AS CACD3 (MG/L)	DIS= SOLVED SULFATE (SO4) (MG/L)	DIS= SOLVED CHLO= WIDE (CL) (MG/L)	DIS= SOLVED NITRATE (N) (MG/L)
OCT. 30...	38	8.0	98	107	0	88	47	150	.59
NOV. 13...	42	8.0	54	122	0	100	44	84	.39
DEC. 12...	33	8.2	40	115	0	94	29	--	.50
JAN. 15...	--	--	--	--	--	--	--	--	.65
MAR. 29...	38	6.7	34	109	0	89	38	46	.75
APR. 24...	39	8.3	59	115	0	94	46	87	.69
MAY 22...	44	11	90	124	0	102	56	140	--
JUNE 28...	37	7.6	31	114	0	94	24	37	3.8
SEP. 10...	40	9.2	82	113	0	93	44	130	--
DATE	DIS= SOLVED NITRATE (NO3) (MG/L)	DIS= SOLVED NITRITE (N) (MG/L)	DIS= SOLVED NITRITE (NO2) (MG/L)	DIS= SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL PHOS= PHORUS (P) (MG/L)	DIS= SOLVED SULIDS (RESID) DUE AT 180 C) (MG/L)	DIS= SOLVED SULIDS (TONS PER AC=PT) (MG/L)	NON= CAR= BONATE HARD= NESS (MG/L)	NON= CAR= BONATE HARD= NESS (MG/L)
OCT. 30...	2.6	.03	.10	.62	--	423	.58	130	40
NOV. 13...	1.7	.04	.13	.43	.14	317	.43	140	38
DEC. 12...	2.2	.01	.03	.51	--	291	.34	120	22
JAN. 15...	2.9	.00	.00	.65	.12	--	--	--	--
MAR. 29...	3.3	.07	.23	.82	.16	247	.34	120	33
APR. 24...	3.1	.01	.03	.70	.13	316	.43	130	37
MAY 22...	--	--	--	.58	--	434	.59	160	58
JUNE 28...	17	.08	.26	3.9	--	197	.27	120	30
SEP. 10...	--	--	--	.94	.22	360	.92	160	45
DATE	SODIUM AD= BORPH= TION RATIO	SPE= CIFIC CON= DUCT= ANCE (MICRO= MHOS)	PH (UNITS)	TEMPER= ATURE (DEG C)	DIS= SOLVED OXYGEN (MG/L)	PER= CENT SATUR= ATION	CHEM= ICAL OXYGEN DEMAND (LOW LEVEL) (MG/L)	BIU= CHEN= ICUL OXYGEN 5 DAY (MG/L)	CARBON DIOXIDE (CO2) (MG/L)
OCT. 30...	3.8	770	7.7	17.0	10.9	120	3	.2	3.4
NOV. 13...	2.8	535	8.1	12.5	10.2	100	18	.5	1.6
DEC. 12...	1.6	480	7.5	12.0	11.0	107	21	1.0	5.6
JAN. 15...	--	580	8.2	6.0	11.6	97	20	1.0	--
MAR. 29...	1.3	380	7.9	12.0	11.0	109	16	1.8	2.2
APR. 24...	2.2	540	7.9	21.0	--	--	11	1.8	2.3
MAY 22...	3.1	890	7.6	25.0	8.2	104	30	6.1	5.0
JUNE 28...	1.2	880	8.2	28.0	8.5	106	10	3.4	1.2
SEP. 10...	3.0	680	7.8	27.0	7.6	99	16	1.6	2.9



xc: CAG for Jack Rothfleisch
DR 8-1-11
PAUL R. WILSON, Acting Executive Director

OKLAHOMA WATER RESOURCES BOARD

FIFTH FLOOR • JIM THORPE BUILDING • OKLAHOMA CITY, OKLA. 73105

July 20, 1977

Kerr-McGee Nuclear Corporation
(Sequoyah Facility)
Kerr-McGee Center
Oklahoma City, OK 73125

RE: Permit No. WD-75-074

Gentlemen:

This is to advise you that your application for a waste disposal permit was approved by the Oklahoma Water Resources Board. Your permit is enclosed with this letter. Please be certain that all items of your permit are fully understood.

If your permit is for the discharge of wastes to the waters of the State, sample analyses must be performed by a certified laboratory. If you have industrial waste hauled from your facility, such waste must be hauled by an Oklahoma Water Resources Board approved waste hauler.

On occasions, personnel from the Oklahoma Water Resources Board will visit your facilities. If a special visit is desired at any time, please notify our Water Quality Division.

If you should have any questions regarding your permit, please let us hear from you.

Sincerely,

Paul R. Wilson
Paul R. Wilson
Assistant Director

PRW:GS:meg

- ENCLOSURE: Permit
List of Certified Laboratories
List of Approved Waste Haulers

OKLAHOMA WATER RESOURCES BOARD
WASTE DISPOSAL PERMIT
KERR-McGEE NUCLEAR CORPORATION
(SEQUOYAH FACILITY)
KERR-McGEE CENTER
OKLAHOMA CITY, OKLAHOMA 73125

PERMIT NO. WD-75-074

I.D. NO. 68000010

EFFECTIVE DATE: July 12, 1977

EXPIRATION DATE: July 11, 1982

TYPE OF WASTE: Waste consists of waste water associated with the conversion of uranium ore concentrates to uranium hexafluoride.

DISCHARGE POINT: Waste water is discharged to an unnamed ditch, a tributary of Robert S. Kerr Reservoir, at a point located in the NE $\frac{1}{4}$, Section 21, Township 12N, Range 21E1M, Sequoyah County, Oklahoma.

SPECIAL CONDITIONS: (1) The permittee shall be allowed to discharge waste water provided the parametric values listed below are not exceeded:

(a) For the period beginning the effective date and lasting through operation at present production capacity:

<u>PARAMETER</u>	<u>DAILY AVERAGE CONCENTRATION</u>	<u>DAILY MAXIMUM CONCENTRATION</u>
Total Suspended Solids	190.0 kg/day	380.0 kg/day
Fluoride	7.7 kg/day	19.0 kg/day
Nitrate (as N)	19.0 kg/day	77.0 kg/day
Oil and Grease	N/A	15.0 mg/l

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

(b) For the period beginning with the date of increased production capacity and lasting through the expiration date:

<u>PARAMETER</u>	<u>DAILY AVERAGE CONCENTRATION</u>	<u>DAILY MAXIMUM CONCENTRATION</u>
Total Suspended Solids	340.0 kg/day	680.0 kg/day
Fluoride	14.0 kg/day	34.0 kg/day
Nitrate (as N)	34.0 kg/day	136.0 kg/day
Oil and Grease	N/A	15.0 mg/l

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

(2) There shall be no discharge of floating solids or visible foam in other than trace amounts.

REPORT REQUIREMENTS: (1) The permittee shall monitor the discharge in accordance with the following schedule and report the results to the Oklahoma Water Resource Board on or by the 28th day of January, April, July and October of each year, the following information for the previous quarter:

<u>PARAMETER</u>	<u>FREQUENCY</u>	<u>TYPE OF SAMPLE*</u>
Flow	Continuous	Record
Total Suspended Solids	3/week	24-hour composite
Fluoride	3/week	24-hour composite
Nitrate (as N)	3/week	24-hour composite
Oil and Grease	3/week	Grab
pH	3/day	Grab
Uranium (total)	1/month	Grab
Radium (total)	1/3 months	Grab
Gross Alpha	1/month	Grab
Gross Beta	1/month	Grab

*All samples are to be collected during normal operation. Analyses must be performed by a laboratory certified by the Oklahoma Water Resource Board.

(2) The permittee shall monitor the Illinois River on a once per month basis for gross alpha, gross beta, nitrate (as N), fluoride, and uranium (total) at the following locations:

- (a) Illinois River at U.S. Hwy 64 bridge (sample site 2201).
- (b) Illinois River (headwaters of Robert S. Kerr Reservoir) approximately 200 yards below outfall of combination stream (sample site 2202).

In addition, monthly samples shall be collected at these locations and analyzed for radium-226 and 228, for a period of six (6) months following the effective date of this permit.

(3) All information obtained in conjunction with the permittee's ground water monitoring program shall be submitted to the Oklahoma Water Resources Board, annually.

(4) Whenever a spill or accidental discharge occurs, which may or may tend to cause pollution, the Oklahoma Water Resources Board shall be notified immediately, such notification to be followed by a letter of explanation.

CERTIFICATION:

This is to certify that the proposed waste discharge described in this permit meets the requirements of Oklahoma's Water Quality Standards.

APPROVAL:

Approved by the Oklahoma Water Resources Board on the 12th day of July, 19 77.

OKLAHOMA WATER RESOURCES BOARD

Paul R. Wilson
Paul R. Wilson, Assistant Director

Kerr-McGee Nuclear Corproati

DATE OF DOCUMENT

09/16/77

DATE REC

X99X1

NO

09/19/77

07672

LTR

MEMO

JRT

OTHER

X

TO

J. E. Rothfleisch

ORIG

CC

OTHER

X

ACTION NECESSARY

☐

CONCURRENCE

☐

DATE ANSWERED

NO ACTION NECESSARY

☐

COMMENT

☐

BY

CLASSIF

POST OFFICE

U

REG NO

FILE CODE

040-08027

DESCRIPTION (Must Be Unclassified)

Refer to ltr of 8/13/77 transmitting
calculated dose estimates

REFERRED TO

DATE

RECEIVED BY

DATE

Rothfleisch (adv cy) 8/28/77

Rouse

Martin

Reg file cy

9/26/77

PDR

I&E (2)

REMARKS

1 cy rec.

LPDR

07672 het



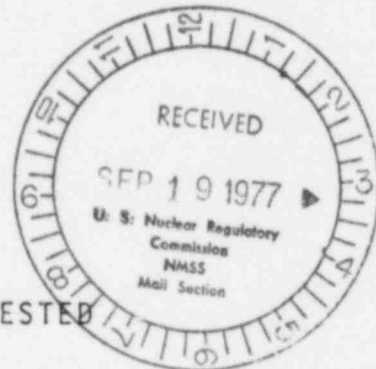
KERR-McGEE NUCLEAR CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

September 16, 1977



REGULATORY FILE CY



CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. E. Rothfleisch
Fuel Cycle Licensing Branch 1
Division of Materials and Fuel Cycle
Facility Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

DOCKET NO. 40-8027

Dear Mr. Rothfleisch:

Please refer to my letter of August 13, transmitting calculated dose estimates. As I described, a Consultant was doing some additional work to provide the estimated individual dose and population dose in annular rings out to 50 miles. Their report is attached for your information. As you will note, their estimate of the data, based on release rates and the considerations of individual nuclides results in a significantly lower dose estimate than the 1972 calculation.

Please let us know if we can provide additional information.

Very truly yours,

W. J. Shelley
W. J. Shelley, Director
Regulation and Control

WJS:hw

Attachment

07673

85 LPH 273

DRAFT REPORT

CALCULATION OF POTENTIAL IMPACT OF RELEASES FROM
THE SEQUOYAH UF₆ FACILITY FOR THE YEAR 1976 AND 2000

KERR-McGEE CORPORATION

07672

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- 1.0 INTRODUCTION
- 2.0 SUMMARY
- 3.0 INPUT DATA
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 - 3.2 Population
 - 3.3 Emission Data
- 4.0 ANALYSIS AND RESULTS
 - 4.1 Population and Individual Dose
- 5.0 REFERENCES

1.0 INTRODUCTION

In July of 1977 the Kerr-McGee Nuclear Corporation requested¹ that Dames & Moore update the 1972 dose and manrem calculation for the Sequoyah UF₆ Facility² near Gore, Oklahoma. This report presents the results of an updated calculation using the computer code AIREM³. Both inhalation and ingestion dose and manrem were calculated for the years 1976 and 2000. The calculations for the year 1976 were based upon population data from the 1970 census and actual emissions, while the calculations for the year 2000 were based upon population growth estimates and projected emission rates.

2.0 SUMMARY

Calculations of annual individual dose and total population dose were made for the Serayah UF_6 facility for the years 1976 and 2000 AD. The results of these calculations indicate that peak individual dose for each organ is lower than those results obtained from the 1972 calculations. All values are well below the radiation protection standard.

07672

3.0 INPUT DATA

3.1 Meteorology

The meteorological data base used in this study is identical to that used in the previous study (43847 observations taken at Fort Smith, Arkansas during the period from January 1960 to December 1964)². The joint frequency distribution of the wind direction and Pasquill stability class⁴ and the mean wind speed for each wind direction/stability combination are presented in Tables 1 and 2, respectively. These differ from those used in 1972 only in that the stability categories D* (day) and D** (night) were combined to yield the D class and the F and G were combined to yield the F class. This was done to accommodate the input requirements of AIREM (it accepts only six stability categories). Frequencies and mean wind speeds for each combined category were obtained by summing and taking a weighted average, respectively.

3.2 Population

Demographic data for use in this study was provided by Kerr McGee⁵ in a format consistent with input requirements for the AIREM code. Tables 3 and 4 present the data used in the analyses for the years 1976 and 2000, respectively. Each entry in these tables represents the population residing in an annular portion of a $22\frac{1}{2}^{\circ}$ sector in a given direction away from the Sequoyah OF₆ Facility. The heaviest population for 1970 within ten miles of the site is located in annular section which contains the town of Vian ($7\frac{1}{2}$ miles east of the plant site); a secondary peak in population occurs 3.5 to the northwest of the site. In the intervals between 10 and 50 miles the 1970 shows peaks 45 miles to the south south east (Fort Smith) and 25 miles to the northwest (Muskogee). The

population projections for the year 2000 were taken from publications of the Universities of Oklahoma⁷ and Arkansas⁸. The demographic data for the year 2000 within 10 miles of the site shows a peak at Vian and secondary peak 3.5 miles to the northwest. In the region between 10 and 50 miles Fort Smith and Muskogee remain principal areas of concentrated population.

3.3 Emission and Related Input

Kerr McGee supplied information on the emissions⁵ for the years 1976 and 2000 and its isotopic analysis⁶. Table 5 presents the isotopic analysis, while Tables 6 and 7 present the emission data for the years 1976 and 2000, respectively. Note that the distribution of mass between the soluble and insoluble components of the release for the 1976 release was obtained by scaling using the estimates for the year 2000. Table 8 presents the decay rates and dose conversion factors for each isotope considered in the AIREM calculation. The inhalation dose conversion factors were obtained by multiplying the adult inhalation factors contained in Nuclear Regulatory Commission Guide 1.109⁹ (RG 1.109) by a nominal breathing rate of 7300 m³/yr. Ingestion dose conversion factors were obtained by using the RG 1.109 approach. The source strengths for the soluble emissions were used in the calculation of individual and population dose for the kidney, bone, and body, while the insoluble source strengths were used for the calculation of individual and population dose for the lung.

4.0 RESULTS

4.1 Total Population Dose and Individual Dose

Table 9 presents the total population dose for inhalation and ingestion doses in manrem for each organ for the years 1976 and 2000. These results include both elevated and ground level releases. The 1976 kidney dose is approximately the same as the 1972 dose. The whole body and lung dose for 1976 is smaller than the 1972 dose; this can be attributed to the use of different dose conversion factors and the use of an isotopic analysis. Table 10 illustrates the difference in the inhalation factors.

The population doses for the year 2000 are again lower for the lung and body. The dose for kidney is approximately an order of magnitude higher than in 1972, while the bone dose is two orders of magnitude higher. Both of these increases result from the contribution of ingestion.

Tables 11 to 16 presents the individual inhalation and ingestion doses for the 1976 release for the kidney, lung, bone and body. Note that the ingestion dose has been limited to the kidney and bone, this decision was made on the basis of the relative sizes of the ingestion dose conversion factors. The peak individual inhalation dose are doses .014 mrem for the kidney, 2.4 mrem for the lung, .062 mrem for the bone, and .037 mrem for the body. The peak individual ingestion doses are .24 E-03 for the kidney and .001 for the bone.

Tables 17 to 22 present the individual inhalation and ingestion doses for each organ for the 2000 AD release. The peak inhalation doses are .022 mrem for the kidney, 3.2 mrem for the lung, .081 mrem for the bone, and .556 E-02 mrem for the body. The peak ingestion doses are .0016 mrem for the bone and .37 E-03 for the kidney. Table 23 presents a comparison between 1972, 1976 and 2000 peak individual doses.

5.0 REFERENCES

1. Written Correspondence between Mr. I. Spickler of Dames & Moore and W.J. Shelley of the Kerr-McGee Nuclear Corporation, August 9, 1977.
2. Dames & Moore, 1972: Calculation of Potential Impact of Releases; Sequoyah UF₆ Facility; Kerr-McGee Corporation.
3. Airem Program Manual, A Computer Code for Calculating Doses and Ground Depositions Due to Atmospheric Emissions of Radionuclides, EPA-520/1-74-004, J.A. Martin, Jr., etal, May 1974.
4. Uniform Summary of Surface Weather Observations, Part A, Fort Smith, Arkansas Municipal Airport, Data Processing Division Climatic Center USAF; August 1963.
5. Written Correspondence between Mr. I. Spickler of Dames & Moore and W.J. Shelley of the Kerr-McGee Nuclear Corporation, July 30, 1977.
6. Written Correspondence between Mr. I. Spickler of Dames & Moore and W.J. Shelley of the Kerr-McGee Nuclear Corporation, August 9, 1977.
7. Supplement: Statistic Abstract of Oklahoma 1972, Center for Economic Research and Management Research University of Oklahoma, Norman, Oklahoma.
8. Population Estimate for Sebastian, Crawford, and Washington Counties, Arkansas, Industrial Research and Extension Center, University of Arkansas, Little Rock.
9. Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, U.S. Nuclear Regulatory Commission, Regulatory Guide 1.109, March 1976.

TABLE 1

JOINT FREQUENCY TABLE (%)
WIND DIRECTION -VS- STABILITY CLASS
FORT SMITH, ARKANSAS
1960-1964

Wind Direction	Stability Class					
	A	B	C	D	E	F
NNE	.04	.35	.37	1.31	.84	2.84
NE	.09	.82	1.30	2.85	1.86	6.68
ENE	.10	.97	2.46	6.76	2.07	4.26
E	.07	.55	1.21	4.92	1.07	1.80
ESE	.05	.38	.71	1.85	.51	.97
SE	.09	.46	.72	1.70	.47	1.24
SSE	.05	.30	.48	1.12	.29	.62
S	.06	.49	.68	1.63	.42	1.11
SSW	.06	.45	.99	2.14	.38	.88
SW	.09	.57	1.17	2.22	.52	1.66
WSW	.08	.49	.93	1.62	.55	1.84
W	.05	.30	.72	2.46	.94	1.00
WNW	.05	.27	.57	2.64	.49	.42
NW	.06	.25	.43	2.02	.44	.52
NNW	.03	.19	.37	1.82	.38	.45
N	.03	.27	.37	1.88	.69	1.17

TABLE 2

MEAN WIND SPEED (MSEC⁻¹)
 WIND DIRECTION -VS- STABILITY CLASS
 FORT SMITH, ARKANSAS
 1960-1964

Wind Direction	Stability Class					
	A	B	C	D	E	F
NNE	1.71	2.41	3.39	4.04	2.83	1.48
NE	1.72	2.51	3.10	3.15	2.74	1.55
ENE	1.89	2.69	3.55	3.96	3.05	1.63
E	1.81	2.60	3.78	4.52	3.17	1.48
ESE	1.93	2.60	3.83	4.20	2.95	1.44
SE	1.82	2.65	3.72	3.83	2.79	1.37
SSE	1.84	2.80	4.04	4.11	2.79	1.42
S	1.77	2.77	3.94	4.52	3.00	1.60
SSW	1.84	3.02	4.45	5.35	3.14	1.45
SW	1.90	2.80	4.42	5.26	3.40	1.45
WSW	1.94	2.80	3.88	4.46	3.36	1.68
W	1.88	2.83	4.00	5.23	3.89	1.85
WNW	1.89	2.92	4.11	6.05	3.97	1.90
NW	1.85	2.51	3.97	5.27	3.97	1.68
NNW	1.87	2.52	4.20	5.40	3.96	1.72
N	1.84	2.44	3.63	5.27	3.65	1.55

TABLE 3
POPULATION DISTRIBUTION
1970 CENSUS
SEQUOYAH FACILITY
DISTANCE (MILES)

SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
NNE	3	6	21	9	6	143	891	11114	2016	1480
NE	9	3	0	6	3	309	844	1394	5731	4913
ENE	12	15	3	15	6	190	742	913	1360	1195
E	3	27	33	24	53	1422	2988	1240	7327	18982
ESE	0	15	36	50	3	241	3712	3272	7432	57481
SE	0	6	3	48	15	53	309	2309	6525	7140
SSE	6	9	6	0	50	33	1204	1291	296	3751
S	3	12	0	0	12	12	2661	352	1037	780
SSW	0	3	0	3	30	119	491	1006	1582	3724
SW	3	0	0	12	6	160	1155	972	591	853
WSW	3	0	6	9	3	122	321	696	3324	968
W	0	0	24	202	27	176	1817	4256	1565	8211
WNW	3	0	170	164	5	70	953	1281	1995	1719
NW	3	18	489	46	27	103	12439	25522	4240	4836
NNW	3	3	14	49	19	122	1049	3023	5566	2354
N	3	9	3	12	42	303	119	3393	2428	4381

TABLE 4

POPULATION DISTRIBUTION
2000 PROJECTION
SEQUOYAH FACILITY

DISTANCE (MILES)

SECTOR

	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
NNE	13	16	96	59	27	393	1391	14614	3516	1680
NE	24	8	15	56	53	809	1044	1894	8216	6492
ENE	27	45	18	65	56	490	742	1113	1719	1195
E	13	87	133	174	503	4922	5899	1740	11319	28982
ESE	5	45	161	350	53	941	6712	3772	9817	85681
SE	0	16	18	348	115	203	431	4181	9325	11140
SSE	16	19	26	50	100	183	1304	1291	296	4501
S	13	27	10	50	212	162	2911	352	1537	1280
SSW	0	8	10	53	280	369	491	1006	1582	5724
SW	8	0	10	112	56	460	1555	1022	1091	1545
WSW	8	0	16	59	53	372	521	1396	4324	968
W	0	0	99	952	327	826	3317	4756	2193	9471
WNW	8	0	370	614	115	320	3953	2281	2495	2019
NW	13	43	1589	346	227	403	18439	36555	5540	12836
NNW	8	8	64	349	119	422	1649	4723	9066	5854
N	13	29	18	112	342	803	119	5393	3628	6007

TABLE 5

ISOTOPIC* ANALYSIS FOR SEOUJOYAH FACILITY (APRIL 1977)

<u>Isotope</u>	<u>UF₆ pCi/gm (Soluble UF₆)</u>	<u>Plant Dust pCi/gm (Insoluble)</u>
U-238	2.25E+05	2.44E+05
U-235	6.47E+03	1.11E+04
U-234	2.29E+05	2.30E+05
Th-230	4.78E+01	1.58E+02
Ra-226	3.70E+00	1.77E+01

*U-238 values calculated from chemical uranium analysis

Ra-226 includes Ra-224

Th-230 and U-234 values for analysis of alpha pulse height

U-235 from analysis of gamma pulse height

TABLE 6

EMISSION RATES* FOR 1976 FOR THE SEQUOYAH FACILITY

<u>Release Type</u>	<u>Total (g month⁻¹)</u>	<u>Soluable (g month⁻¹)</u>	<u>Insoluable (g month⁻¹)</u>
Elevated			
Main Stack	12	0	12
Scrubber	1980	1980	0
Total	1992	1980	12
Ground Level			
Samp Rm	111	0	111
Roof Vent	1750	175	1575
Roof Hatches	1414	141	1273
Dust Collector	308	31	277
Total	3583	347	3236

* Note that soluable and insoluable fractions were assumed to be proportional to that given for the year 2000.

TABLE 7

EMISSION RATES* FOR 2000 FOR THE SEQUOYAH FACILITY

<u>Release Type</u>	<u>Total (g month⁻¹)</u>	<u>Soluable (g month⁻¹)</u>	<u>Insoluable (g month⁻¹)</u>
Elevated			
Main Stack	28	0	28
Scrubber	4633	4633	0
Total	4661	4633	28
Ground Level			
Samp Rm ¹	260	0	260
Roof Vent ¹	2301	230	2071
Roof Hatches ¹	1852	185	1667
Dust Collector ¹	403	40	363
Total	4816	455	4361

¹ Assumed 30% UO₃, 30% UO₂, 30% UF₄, 10% UO₂F₂

* Estimated on the basis a .25 rate increase of the increased production (i.e., a factor of 1.31)

TABLE 8

ISOTOPE PROPERTIES USE IN AIREM CALCULATION

Isotope	Decay (sec^{-1})	Inhalation Dose Conversion Factor ($\frac{\text{m rem}}{\text{sec} \cdot \text{ci/m}^3}$)				Ingestion Dose Conversion Factor ($\frac{\text{m rem}}{\text{pci}}$)	
		Kidney	Lung	Bone	Body	Bone	Kidney
U-238	4.87E-18	5.05E+05	1.07E+07	2.22E+06	1.31E+05	7.67E-04	1.75E-04
U-235	3.10E-17	5.42E+05	1.13E+07	2.31E+06	1.40E+05	8.02E-04	1.87E-04
U-234	8.90E-13	5.76E+05	1.21E+07	2.08E+06	1.49E+05	8.37E-04	1.99E-04
Th-230	3.96E-13	1.48E+08	1.44E+08	5.30E+08	1.47E+07	2.08E-03	5.69E-04
Ra-226	1.98E-11	1.57E+04	2.71E+07	2.89E+07	2.11E+07	3.05E-01	1.63E-04

TABLE 9

RADIONUCLIDE CONTRIBUTION TO POPULATION DOSE (man rem)

<u>Organ</u>	1976 Release				2000 Release		
	<u>1972 Calculation</u>	<u>Inhalation</u>	<u>Ingestion</u>	<u>Total</u>	<u>Inhalation</u>	<u>Ingestion</u>	<u>Total</u>
Kidney	5.59E-02	3.331E-03	.55E-01	5.83E-02	1.978E-02	.29	3.09810 ⁻¹
Lung	6.12E-01	1.13E-01	NA	1.13E-01	4.268E-02	NA	4.268E-02
Bone	1.40E-02	1.546E-02	.23	2.45E-01	5.031E-02	1.3	1.350
Body	4.731E-03	6.679E-04	-*	6.67E-04	4.728E-03	-*	4.728E-03

*Not included because ingestion dose factors much smaller than for other organs.

TABLE 10
COMPARISON OF ADULT INHALATION FACTORS (mrem/pCi)

<u>Organ</u>	<u>1972 Scenario Inhalation Factors</u>	<u>1976 & 2000 Scenarios Inhalation Factors*</u>
Kidney	8.00E-02	2.34E-03
Lung	1.10E-01	4.90E-02
Bone	2.00E-02	9.99E-03

* Averaged over U-238, U-235, and U-234 (principal components of isotopic analysis)

TABLE 11

INDIVIDUAL (INHALATION) DOSE, 1976 AD, SEQUOYAH FACILITY: KIDNEY (MREM) UNIFORM RELEASE RATE

AFFECTED SPECIES	1-1	1-2	2-3	3-4	4-5	5-6	7-8	9-10	11-20	20-30	30-40	40-50
ADP	.33E-02	.70E-02	.60E-02	.40E-02	.20E-02	.20E-02	.20E-02	.10E-02	.14E-04	.55E-05	.32E-05	.11E-05
BF	.40E-02	.11E-02	.60E-02	.40E-02	.20E-02	.20E-02	.20E-02	.10E-02	.17E-04	.65E-05	.37E-05	.25E-05
EHF	.45E-02	.11E-02	.65E-02	.43E-02	.23E-02	.23E-02	.23E-02	.12E-02	.34E-04	.66E-05	.34E-05	.12E-05
E	.36E-02	.63E-02	.52E-02	.34E-02	.24E-02	.24E-02	.24E-02	.12E-02	.32E-04	.63E-05	.31E-05	.26E-05
ESF	.72E-02	.63E-02	.33E-02	.21E-02	.21E-02	.21E-02	.21E-02	.14E-02	.14E-04	.61E-05	.33E-05	.11E-05
SE	.22E-02	.66E-02	.32E-02	.21E-02	.21E-02	.21E-02	.21E-02	.14E-02	.14E-04	.51E-05	.24E-05	0.
SSE	.15E-02	.62E-02	.28E-02	.18E-02	.18E-02	.18E-02	.18E-02	.12E-02	.15E-04	.45E-05	.24E-05	0.
S	.33E-02	.64E-02	.31E-02	.33E-02	.33E-02	.33E-02	.33E-02	.12E-02	.24E-04	.53E-05	.29E-05	0.
SSW	.61E-02	.14E-02	.44E-02	.64E-02	.64E-02	.64E-02	.64E-02	.23E-02	.15E-04	.54E-05	.29E-05	0.
S4	.14E-01	.34E-02	.22E-02	.15E-02	.15E-02	.15E-02	.15E-02	.54E-02	.12E-03	.14E-04	.70E-05	.42E-05
WSW	.13E-01	.34E-02	.20E-02	.13E-02	.13E-02	.13E-02	.13E-02	.44E-02	.12E-03	.26E-04	.12E-04	.73E-05
W	.79E-02	.14E-02	.10E-02	.66E-02	.66E-02	.66E-02	.66E-02	.22E-02	.35E-04	.14E-04	.69E-05	.44E-05
WWS	.35E-02	.64E-02	.31E-02	.35E-02	.35E-02	.35E-02	.35E-02	.11E-02	.15E-04	.57E-05	.31E-05	.11E-05
NW	.41E-02	.64E-02	.34E-02	.34E-02	.34E-02	.34E-02	.34E-02	.24E-02	.15E-04	.57E-05	.32E-05	.11E-05
NWS	.23E-02	.58E-02	.34E-02	.21E-02	.21E-02	.21E-02	.21E-02	.14E-02	.67E-05	.36E-05	.11E-05	0.
N	.34E-02	.64E-02	.44E-02	.31E-02	.31E-02	.31E-02	.31E-02	.22E-02	.24E-04	.54E-05	.29E-05	.10E-05

TABLE 12

INDIVIDUAL (INHALATION), 1976 AD, SEQUOYAH FACILITY: LUNG (MREM)

INDIVIDUAL (INHALATION) DOSE, 1976 AD, SEQUOIAH FACILITY: BONE (MBEM)

AFFECTED	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16	1-17	1-18	1-19	1-20	1-21	1-22	1-23	1-24	1-25	1-26	1-27	1-28	1-29	1-30	1-31	1-32	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-40	1-41	1-42	1-43	1-44	1-45	1-46	1-47	1-48	1-49	1-50	1-51	1-52	1-53	1-54	1-55	1-56	1-57	1-58	1-59	1-60	1-61	1-62	1-63	1-64	1-65	1-66	1-67	1-68	1-69	1-70	1-71	1-72	1-73	1-74	1-75	1-76	1-77	1-78	1-79	1-80	1-81	1-82	1-83	1-84	1-85	1-86	1-87	1-88	1-89	1-90	1-91	1-92	1-93	1-94	1-95	1-96	1-97	1-98	1-99	1-100	1-101	1-102	1-103	1-104	1-105	1-106	1-107	1-108	1-109	1-110	1-111	1-112	1-113	1-114	1-115	1-116	1-117	1-118	1-119	1-120	1-121	1-122	1-123	1-124	1-125	1-126	1-127	1-128	1-129	1-130	1-131	1-132	1-133	1-134	1-135	1-136	1-137	1-138	1-139	1-140	1-141	1-142	1-143	1-144	1-145	1-146	1-147	1-148	1-149	1-150	1-151	1-152	1-153	1-154	1-155	1-156	1-157	1-158	1-159	1-160	1-161	1-162	1-163	1-164	1-165	1-166	1-167	1-168	1-169	1-170	1-171	1-172	1-173	1-174	1-175	1-176	1-177	1-178	1-179	1-180	1-181	1-182	1-183	1-184	1-185	1-186	1-187	1-188	1-189	1-190	1-191	1-192	1-193	1-194	1-195	1-196	1-197	1-198	1-199	1-200	1-201	1-202	1-203	1-204	1-205	1-206	1-207	1-208	1-209	1-210	1-211	1-212	1-213	1-214	1-215	1-216	1-217	1-218	1-219	1-220	1-221	1-222	1-223	1-224	1-225	1-226	1-227	1-228	1-229	1-230	1-231	1-232	1-233	1-234	1-235	1-236	1-237	1-238	1-239	1-240	1-241	1-242	1-243	1-244	1-245	1-246	1-247	1-248	1-249	1-250	1-251	1-252	1-253	1-254	1-255	1-256	1-257	1-258	1-259	1-260	1-261	1-262	1-263	1-264	1-265	1-266	1-267	1-268	1-269	1-270	1-271	1-272	1-273	1-274	1-275	1-276	1-277	1-278	1-279	1-280	1-281	1-282	1-283	1-284	1-285	1-286	1-287	1-288	1-289	1-290	1-291	1-292	1-293	1-294	1-295	1-296	1-297	1-298	1-299	1-300	1-301	1-302	1-303	1-304	1-305	1-306	1-307	1-308	1-309	1-310	1-311	1-312	1-313	1-314	1-315	1-316	1-317	1-318	1-319	1-320	1-321	1-322	1-323	1-324	1-325	1-326	1-327	1-328	1-329	1-330	1-331	1-332	1-333	1-334	1-335	1-336	1-337	1-338	1-339	1-340	1-341	1-342	1-343	1-344	1-345	1-346	1-347	1-348	1-349	1-350	1-351	1-352	1-353	1-354	1-355	1-356	1-357	1-358	1-359	1-360	1-361	1-362	1-363	1-364	1-365	1-366	1-367	1-368	1-369	1-370	1-371	1-372	1-373	1-374	1-375	1-376	1-377	1-378	1-379	1-380	1-381	1-382	1-383	1-384	1-385	1-386	1-387	1-388	1-389	1-390	1-391	1-392	1-393	1-394	1-395	1-396	1-397	1-398	1-399	1-400	1-401	1-402	1-403	1-404	1-405	1-406	1-407	1-408	1-409	1-410	1-411	1-412	1-413	1-414	1-415	1-416	1-417	1-418	1-419	1-420	1-421	1-422	1-423	1-424	1-425	1-426	1-427	1-428	1-429	1-430	1-431	1-432	1-433	1-434	1-435	1-436	1-437	1-438	1-439	1-440	1-441	1-442	1-443	1-444	1-445	1-446	1-447	1-448	1-449	1-450	1-451	1-452	1-453	1-454	1-455	1-456	1-457	1-458	1-459	1-460	1-461	1-462	1-463	1-464	1-465	1-466	1-467	1-468	1-469	1-470	1-471	1-472	1-473	1-474	1-475	1-476	1-477	1-478	1-479	1-480	1-481	1-482	1-483	1-484	1-485	1-486	1-487	1-488	1-489	1-490	1-491	1-492	1-493	1-494	1-495	1-496	1-497	1-498	1-499	1-500	1-501	1-502	1-503	1-504	1-505	1-506	1-507	1-508	1-509	1-510	1-511	1-512	1-513	1-514	1-515	1-516	1-517	1-518	1-519	1-520	1-521	1-522	1-523	1-524	1-525	1-526	1-527	1-528	1-529	1-530	1-531	1-532	1-533	1-534	1-535	1-536	1-537	1-538	1-539	1-540	1-541	1-542	1-543	1-544	1-545	1-546	1-547	1-548	1-549	1-550	1-551	1-552	1-553	1-554	1-555	1-556	1-557	1-558	1-559	1-560	1-561	1-562	1-563	1-564	1-565	1-566	1-567	1-568	1-569	1-570	1-571	1-572	1-573	1-574	1-575	1-576	1-577	1-578	1-579	1-580	1-581	1-582	1-583	1-584	1-585	1-586	1-587	1-588	1-589	1-590	1-591	1-592	1-593	1-594	1-595	1-596	1-597	1-598	1-599	1-600	1-601	1-602	1-603	1-604	1-605	1-606	1-607	1-608	1-609	1-610	1-611	1-612	1-613	1-614	1-615	1-616	1-617	1-618	1-619	1-620	1-621	1-622	1-623	1-624	1-625	1-626	1-627	1-628	1-629	1-630	1-631	1-632	1-633	1-634	1-635	1-636	1-637	1-638	1-639	1-640	1-641	1-642	1-643	1-644	1-645	1-646	1-647	1-648	1-649	1-650	1-651	1-652	1-653	1-654	1-655	1-656	1-657	1-658	1-659	1-660	1-661	1-662	1-663	1-664	1-665	1-666	1-667	1-668	1-669	1-670	1-671	1-672	1-673	1-674	1-675	1-676	1-677	1-678	1-679	1-680	1-681	1-682	1-683	1-684	1-685	1-686	1-687	1-688	1-689	1-690	1-691	1-692	1-693	1-694	1-695	1-696	1-697	1-698	1-699	1-700	1-701	1-702	1-703	1-704	1-705	1-706	1-707	1-708	1-709	1-710	1-711	1-712	1-713	1-714	1-715	1-716	1-717	1-718	1-719	1-720	1-721	1-722	1-723	1-724	1-725	1-726	1-727	1-728	1-729	1-730	1-731	1-732	1-733	1-734	1-735	1-736	1-737	1-738	1-739	1-740	1-741	1-742	1-743	1-744	1-745	1-746	1-747	1-748	1-749	1-750	1-751	1-752	1-753	1-754	1-755	1-756	1-757	1-758	1-759	1-760	1-761	1-762	1-763	1-764	1-765	1-766	1-767	1-768	1-769	1-770	1-771	1-772	1-773	1-774	1-775	1-776	1-777	1-778	1-779	1-780	1-781	1-782	1-783	1-784	1-785	1-786	1-787	1-788	1-789	1-790	1-791	1-792	1-793	1-794	1-795	1-796	1-797	1-798	1-799	1-800	1-801	1-802	1-803	1-804	1-805	1-806	1-807	1-808	1-809	1-810	1-811	1-812	1-813	1-814	1-815	1-816	1-817	1-818	1-819	1-820	1-821	1-822	1-823	1-824	1-825	1-826	1-827	1-828	1-829	1-830	1-831	1-832	1-833	1-834	1-835	1-836	1-837	1-838	1-839	1-840	1-841	1-842	1-843	1-844	1-845	1-846	1-847	1-848	1-849	1-850	1-851	1-852	1-853	1-854	1-855	1-856	1-857	1-858	1-859	1-860	1-861	1-862	1-863	1-864	1-865	1-866	1-867	1-868	1-869	1-870	1-871	1-872	1-873	1-874	1-875	1-876	1-877	1-878	1-879	1-880	1-881	1-882	1-883	1-884	1-885	1-886	1-887	1-888	1-889	1-890	1-891	1-892	1-893	1-894	1-895	1-896	1-897	1-898	1-899	1-900	1-901	1-902	1-903	1-904	1-905	1-906	1-907	1-908	1-909	1-910	1-911	1-912	1-913	1-914	1-915	1-916	1-917	1-918	1-919	1-920	1-921	1-922	1-923	1-924	1-925	1-926	1-927	1-928	1-929	1-930	1-931	1-932	1-933	1-934	1-935	1-936	1-937	1-938	1-939	1-940	1-941	1-942	1-943	1-944	1-945	1-946	1-947	1-948	1-949	1-950	1-951	1-952	1-953	1-954	1-955	1-956	1-957	1-958	1-959	1-960	1-961	1-962	1-963	1-964	1-965	1-966	1-967	1-968	1-969	1-970	1-971	1-972	1-973	1-974	1-975	1-976	1-977	1-978	1-979	1-980	1-981	1-982	1-983	1-984	1-985	1-986	1-987	1-988	1-989	1-990	1-991	1-992	1-993	1-994	1-995	1-996	1-997	1-998	1-999	1-1000	1-1001	1-1002	1-1003	1-1004	1-1005	1-1006	1-1007	1-1008	1-1009	1-1010	1-1011	1-1012	1-1013	1-1014	1-1015	1-1016	1-1017	1-1018	1-1019	1-1020	1-1021	1-1022	1-1023	1-1024	1-1025	1-1026	1-1027	1-1028	1-1029	1-1030	1-1031	1-1032	1-1033	1-1034	1-1035	1-1036	1-1037	1-1038	1-1039	1-1040	1-1041	1-1042	1-1043	1-1044	1-1045	1-1046	1-1047	1-1048	1-1049	1-1050	1-1051	1-1052	1-1053	1-1054	1-1055	1-1056	1-1057	1-1058	1-1059	1-1060	1-1061	1-1062	1-1063	1-1064	1-1065	1-1066	1-1067	1-1068	1-1069	1-1070	1-1071	1-1072	1-1073	1-1074	1-1075	1-1076	1-1077	1-1078	1-1079	1-1080	1-1081	1-1082	1-1083	1-1084	1-1085	1-1086	1-1087	1-1088	1-1089	1-1090	1-1091	1-1092	1-1093	1-1094	1-1095	1-1096	1-1097	1-1098	1-1099	1-1100	1-1101	1-1102	1-1103	1-1104	1-1105	1-1106	1-1107	1-1108	1-1109	1-1110	1-1111	1-1112	1-1113	1-1114	1-1115	1-1116	1-1117	1-1118	1-1119	1-1120	1-1121	1-1122	1-1123	1-1124	1-1125	1-1126	1-1127	1-1128	1-1129	1-1130	1-1131	1-1132	1-1133	1-1134	1-1135	1-1136	1-1137	1-1138	1-1139	1-1140	1-1141	1-1142	1-1143	1-1144	1-1145	1-1146	1-1147	1-1148	1-1149	1-1150	1-1151	1-1152	1-1153	1-1154	1-1155	1-1156	1-1157	1-1158	1-1159	1-1160	1-1161	1-1162	1-1163	1-1164	1-1165	1-1166	1-1167	1-1168	1-1169	1-1170	1-1171	1-1172	1-1173	1-1174	1-1175	1-1176	1-1177	1-1178	1-1179	1-1180	1-1181	1-1182	1-1183	1-1184	1-1185	1-1186	1-1187	1-1188	1-1189	1-1190	1-1191	1-1192	1-1193	1-1194	1-1195	1-1196	1-1197	1-1198	1-1199	1-1200	1-1201	1-1202	1-1203	1-1204	1-1205	1-1206	1-1207	1-1208	1-1209	1-1210	1-1211	1-1212	1-1213	1-1214	1-
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INDIVIDUAL (INHALATION) DOSE, 1976 AD, SEQUOYAH FACILITY: BODY (MREM)

[illegible]

1976 AD - SEQUOYAH FACILITY
INDIVIDUAL (INGESTION) DOSE IN (MREM) FOR KIDNEY

SECTION	6-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
NEF	60E-03	1.0E-04	7.0E-05	5.0E-05	3.0E-05	1.0E-05	5.0E-06	1.1E-06	6.3E-07	4.2E-07
NE	7.1E-03	1.0E-04	7.1E-05	5.0E-05	3.0E-05	1.0E-05	5.0E-06	1.1E-06	7.4E-07	4.9E-07
NEF	7.0E-03	1.0E-04	7.1E-05	5.0E-05	3.0E-05	1.0E-05	5.0E-06	1.3E-06	6.6E-07	4.2E-07
F	5.0E-03	1.0E-04	5.0E-05	3.0E-05	1.0E-05	5.0E-06	2.0E-06	1.6E-06	8.1E-07	5.1E-07
ESL	3.7E-03	1.0E-04	3.7E-05	2.0E-05	1.0E-05	5.0E-06	2.0E-06	1.2E-06	6.5E-07	4.2E-07
SE	3.7E-03	1.0E-04	3.7E-05	2.0E-05	1.0E-05	5.0E-06	2.0E-06	1.0E-06	5.5E-07	3.5E-07
SEF	3.1E-03	1.0E-04	3.1E-05	2.0E-05	1.0E-05	5.0E-06	2.0E-06	8.0E-07	4.7E-07	3.0E-07
S	5.5E-03	1.0E-04	5.5E-05	3.0E-05	1.0E-05	5.0E-06	2.0E-06	1.0E-06	5.8E-07	3.7E-07
SSW	1.0E-03	1.0E-04	1.0E-05	5.0E-06	2.0E-06	1.0E-06	5.0E-07	1.1E-06	5.6E-07	3.4E-07
SW	2.4E-03	1.0E-04	2.4E-05	1.0E-05	5.0E-06	2.0E-06	1.0E-06	2.6E-06	1.4E-06	8.3E-07
WSW	2.2E-03	1.0E-04	2.2E-05	1.0E-05	5.0E-06	2.0E-06	1.0E-06	4.4E-06	2.3E-06	1.4E-06
W	1.2E-03	1.0E-04	1.2E-05	5.0E-06	2.0E-06	1.0E-06	5.0E-07	2.5E-06	1.4E-06	8.7E-07
WSW	5.4E-03	1.0E-04	5.4E-05	3.0E-05	1.0E-05	5.0E-06	2.0E-06	1.1E-06	6.2E-07	4.0E-07
NE	6.4E-03	1.0E-04	6.4E-05	3.0E-05	1.0E-05	5.0E-06	2.0E-06	1.1E-06	6.2E-07	4.0E-07
NSW	3.4E-03	1.0E-05	3.4E-05	2.0E-05	1.0E-05	5.0E-06	2.0E-06	7.0E-07	3.9E-07	2.5E-07
N	5.7E-03	1.0E-04	5.7E-05	3.0E-05	1.0E-05	5.0E-06	2.0E-06	1.1E-06	5.7E-07	3.7E-07

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1976 AD -SEQUOYAH FACILITY

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INDIVIDUAL (INHALATION) DOSE, 2000 AD, SEQUOYAH FACILITY: KIDNEY (MREM)

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INDIVIDUAL (INHALATION) DOSE, 2000 AD, SEQUOYAH FACILITY: LUNG (MREM)

EFFECTOR	DISTANCE (MILES)					40-50
	0-10	10-20	20-30	30-40	40-50	
WNE	56E-00	15E-01	40E-02	21E-02	24E-03	14E-03
NE	93E-00	21E-01	11E-01	7E-02	25E-03	17E-03
E	69E-00	24E-01	12E-01	30E-02	25E-03	14E-03
ESE	59E-00	22E-01	11E-01	12E-02	31E-03	17E-03
E	34E-00	14E-01	7E-02	21E-02	25E-03	14E-03
SE	76E-00	13E-01	76E-02	19E-02	21E-03	12E-03
SSE	31E-00	11E-01	61E-02	17E-02	14E-03	10E-03
S	66E-00	18E-01	51E-02	24E-02	22E-03	12E-03
SSW	14E-01	24E-01	13E-01	79E-02	21E-03	11E-03
SW	32E-01	76E-01	34E-01	29E-01	52E-03	26E-03
WSW	20E-00	73E-01	37E-01	23E-01	48E-03	31E-03
W	13E-01	36E-01	19E-01	12E-01	13E-02	30E-03
WNW	64E-00	17E-01	47E-01	53E-02	24E-03	13E-03
NW	79E-00	17E-01	48E-02	23E-02	24E-03	13E-03
NNW	41E-00	10E-01	53E-02	33E-02	15E-03	85E-04
N	45E-00	17E-01	87E-02	23E-02	22E-03	12E-03

INDIVIDUAL (INHALATION) DOSE, 2000 AD, SEQUOYAH FACILITY: BONE (NREM)

AFFECTED SPECIES	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16	1-17	1-18	1-19	1-20	1-21	1-22	1-23	1-24	1-25	1-26	1-27	1-28	1-29	1-30	1-31	1-32	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-40	1-41	1-42	1-43	1-44	1-45	1-46	1-47	1-48	1-49	1-50	1-51	1-52	1-53	1-54	1-55	1-56	1-57	1-58	1-59	1-60	1-61	1-62	1-63	1-64	1-65	1-66	1-67	1-68	1-69	1-70	1-71	1-72	1-73	1-74	1-75	1-76	1-77	1-78	1-79	1-80	1-81	1-82	1-83	1-84	1-85	1-86	1-87	1-88	1-89	1-90	1-91	1-92	1-93	1-94	1-95	1-96	1-97	1-98	1-99	1-100
1-1	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16	1-17	1-18	1-19	1-20	1-21	1-22	1-23	1-24	1-25	1-26	1-27	1-28	1-29	1-30	1-31	1-32	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-40	1-41	1-42	1-43	1-44	1-45	1-46	1-47	1-48	1-49	1-50	1-51	1-52	1-53	1-54	1-55	1-56	1-57	1-58	1-59	1-60	1-61	1-62	1-63	1-64	1-65	1-66	1-67	1-68	1-69	1-70	1-71	1-72	1-73	1-74	1-75	1-76	1-77	1-78	1-79	1-80	1-81	1-82	1-83	1-84	1-85	1-86	1-87	1-88	1-89	1-90	1-91	1-92	1-93	1-94	1-95	1-96	1-97	1-98	1-99	1-100

INDIVIDUAL (INHALATION) DOSE, 2000 AD, SEQUOYAH FACILITY: WHOLE BODY (MREM)

AFFECTED SECTION	0-1	1-2	2-3	3-4	DISTANCE (FEET)				10-10	-30	30-40	40-50
					0-5	5-10	10-15	15-20				
NNE	.15E-02	.43E-03	.24E-03	.17E-03	.12E-03	.5E-04	.67E-05	.26E-05	0.	0.	0.	0.
NE	.20E-02	.60E-03	.36E-03	.26E-03	.19E-03	.89E-04	.76E-05	.30E-05	0.	0.	0.	0.
ENE	.19E-02	.57E-03	.34E-03	.25E-03	.17E-03	.86E-04	.21E-04	.33E-05	0.	0.	0.	0.
E	.15E-02	.50E-03	.29E-03	.19E-03	.13E-03	.64E-04	.17E-04	.45E-05	.11E-05	0.	0.	0.
ESE	.10E-02	.34E-03	.18E-03	.12E-03	.79E-04	.38E-04	.10E-04	.53E-05	0.	0.	0.	0.
SE	.92E-03	.33E-03	.16E-03	.12E-03	.61E-04	.39E-04	.10E-04	.27E-05	0.	0.	0.	0.
SSE	.44E-03	.24E-03	.16E-03	.10E-03	.69E-04	.33E-04	.89E-05	.24E-05	0.	0.	0.	0.
S	.14E-02	.45E-03	.29E-03	.19E-03	.13E-03	.66E-04	.16E-04	.26E-05	0.	0.	0.	0.
SSW	.23E-02	.76E-03	.53E-03	.37E-03	.26E-03	.13E-03	.74E-05	.28E-05	0.	0.	0.	0.
SW	.56E-02	.18E-02	.13E-02	.86E-03	.61E-03	.31E-03	.87E-04	.68E-05	.32E-05	.10E-05	0.	0.
WSW	.57E-02	.19E-02	.11E-02	.73E-03	.51E-03	.25E-03	.63E-04	.12E-04	.57E-05	.34E-05	0.	0.
W	.30E-02	.10E-02	.58E-03	.34E-03	.26E-03	.13E-03	.17E-04	.66E-05	.35E-05	.12E-05	0.	0.
WNW	.15E-02	.44E-03	.29E-03	.19E-03	.13E-03	.62E-04	.75E-05	.28E-05	0.	0.	0.	0.
NW	.17E-02	.53E-03	.33E-03	.22E-03	.15E-03	.74E-04	.73E-05	.27E-05	0.	0.	0.	0.
NNW	.94E-03	.30E-03	.18E-03	.12E-03	.81E-04	.37E-04	.46E-05	0.	0.	0.	0.	0.
N	.14E-02	.44E-03	.27E-03	.18E-03	.12E-03	.61E-04	.14E-04	.26E-05	0.	0.	0.	0.

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2000 AD - SEQUOIA FACILITY
INDIVIDUAL (INGESTION) DOSE IN (MREM) FOR BONE

AFFECTED SECTOR	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
NEF	40E-03	10E-03	7E-04	4E-04	3E-04	1E-04	3E-05	8E-06	4E-06	2E-06
NEF	50E-03	17E-03	1E-03	7E-04	4E-04	2E-04	7E-05	9E-06	5E-06	3E-06
ENE	62E-03	14E-03	1E-03	6E-04	4E-04	2E-04	6E-05	1E-05	4E-06	2E-06
E	41E-03	14E-03	6E-04	5E-04	3E-04	1E-04	5E-05	14E-05	6E-06	3E-06
ESF	24E-03	94E-04	51E-04	3E-04	2E-04	1E-04	3E-05	1E-05	5E-06	3E-06
SE	26E-03	40E-04	51E-04	3E-04	2E-04	1E-04	3E-05	8E-06	4E-06	2E-06
SSE	23E-03	7E-04	4E-04	2E-04	1E-04	9E-05	7E-05	74E-06	3E-06	24E-06
S	30E-03	13E-03	7E-04	5E-04	3E-04	1E-04	4E-05	4E-06	4E-06	29E-06
SSW	64E-03	21E-03	1E-03	1E-03	7E-04	3E-04	9E-05	8E-06	4E-06	25E-06
SW	16E-02	51E-03	3E-03	2E-03	1E-03	6E-04	2E-04	2E-05	1E-05	5E-06
WSW	16E-02	51E-03	3E-03	2E-03	1E-03	7E-04	1E-04	3E-05	1E-05	1E-05
W	84E-03	24E-03	1E-03	1E-03	7E-04	3E-04	8E-05	2E-05	1E-05	6E-06
WNW	42E-03	13E-03	7E-04	5E-04	3E-04	1E-04	4E-05	8E-06	4E-06	2E-06
NW	49E-03	15E-03	9E-04	6E-04	4E-04	2E-04	4E-05	8E-06	4E-06	2E-06
NNW	27E-03	8E-04	5E-04	3E-04	2E-04	1E-04	2E-05	5E-06	2E-06	1E-06
N	40E-03	12E-03	7E-04	4E-04	3E-04	1E-04	4E-05	8E-06	4E-06	24E-06

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2000 - AN EQUIVANT FACILITY

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TABLE 23

COMPARISON OF PEAK INDIVIDUAL DOSES (mrem)

<u>Organ</u>	<u>1972</u>	<u>1976</u>	<u>Ingestion</u>	<u>2000</u>	<u>Ingestion</u>
		<u>Inhalation</u>		<u>Inhalation</u>	
Kidney	6.20E-01	6.1E-03	2.4E-04	8.9E-03	1.6E-03
Lung	1.12E+01	2.4E+00	-	3.2E-00	-
Bone	1.55E-01	6.21E-02	1.0E-03	8.1E-02	3.7E-04
Body		3.7E-03	-	5.7E-03	-