Department of Energy

Ohio Field Office
Fernald Area Office
P. O. Box 538705
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3769

JUL 13 2001

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SRF-5J
77 West Jackson Boulevard
Chicago, IL 60604-3590

DOE-0725-01

Mr. Thomas J. Schneider, Project Manager
Ohio Environmental Protection Agency
401 East Fifth Street
Dayton, Ohio 45402-2911

PERMIT INFORMATION SUMMARY FOR REPACKAGING ENRICHED URANIUM COMPOUNDS – ADDITIONAL INFORMATION REQUEST

The Ohio Environmental Protection Agency (OEPA) reviewed the Department of Energy's (DOE) letter, "Permit Information Summary for Repackaging Enriched Uranium Compounds", dated May 29, 2001 and requested in a letter dated June 11, 2001, the following additional information be provided:

- CAP-88 model input parameters and results,
- a drawing showing the ventilation system in Building 56A.

Enclosed are the three CAP-88 model runs (Attachments 1, 2, and 3) for the repackaging of the >1% uranium compounds in Building 56A. The results contain the input parameters and the results OEPA has requested. The model calculates an effective dose equivalent (EDE) for each distance inputted for all 16 wind-rose directions and uses the highest value for its maximum EDE. Therefore, the maximum EDE listed on the first page of the synopsis report usually does not correspond to a dose expected at one of our critical receptors. To simplify finding the correct result, the result for the shortest distance to the nearest neighbor for each wind-rose direction has been underlined in the summary report for the models.

A drawing containing a plan view of the project (Attachment 4) has been included. The drawing shows an approximate location where each booth will be installed. It also indicates the approximate location of all radiological emission sources, the boundary of the contamination control area, and the egress points of the building.

Recycled and Recyclable

The monitoring of fugitive emissions from the repackaging station operation will be performed by the site Radiological Control Organization as part of the Occupational Radiation Protection Program. This monitoring will be performed by collecting a combination of general area and breathing zone air samples in Building 56, and by performing routine contamination surveys in the repackaging area of Building 56.

If you have any questions, please contact Ed Skintik at (513) 648-3151.

Sincerely,

Johnny Reising

FEMP:Skintik

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosures

cc w/enclosures:
E. Skintik, OH/FEMP
AR Coordinator, Fluor Fernald, Inc./MS78

cc w/o enclosures:
F. Hodge, Tetra Tech EM, Inc.
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
R. Palmer, Fluor Fernald, Inc./MS65-2
T. Poff, Fluor Fernald, Inc./MS65-2
ECDC, Fluor Fernald, Inc./MS52-7

ATTACHMENT 1

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Apr 27, 2000 8:28 am

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Source Category: DOE Facility - Remediation
Source Type: Stack
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS, Area Ventilation System

Dataset Name: BLDG56REPKG.AVS
Dataset Date: Apr 27, 2000 8:28 am
Wind File: WNDFILES\FEMPSTD.WND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	1.05E-04
BREAST	1.20E-04
R MAR	6.05E-03
LUNGS	4.49E-01
THYROID	1.02E-04
ENDOST	7.89E-02
RMNDR	2.62E-03
EFFEC	5.78E-02

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.87E-03
INHALATION	5.59E-02
AIR IMMERSION	5.66E-10
GROUND SURFACE	2.09E-05
INTERNAL	5.78E-02
EXTERNAL	2.09E-05
TOTAL	5.78E-02

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-234	2.62E-02
U-235	7.75E-04
U-236	5.70E-04
U-238	2.60E-02
TH-230	4.17E-03
TOTAL	5.78E-02

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	5.68E-09
BONE	3.75E-09
THYROID	2.35E-11
BREAST	2.66E-10
LUNG	7.22E-07
STOMACH	1.55E-10
BOWEL	2.14E-10
LIVER	2.34E-10
PANCREAS	1.02E-10
URINARY	5.59E-09
OTHER	1.25E-10
TOTAL	7.38E-07

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	9.78E-09
INHALATION	7.28E-07
AIR IMMERSION	1.32E-14
GROUND SURFACE	4.81E-10
INTERNAL	7.38E-07
EXTERNAL	4.81E-10
TOTAL	7.38E-07

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-234	3.43E-07
U-235	1.02E-08
U-236	7.34E-09
U-238	3.43E-07
TH-230	3.50E-08
TOTAL	7.38E-07

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	750	1089	1574	1339	1134	2370	1206
N	2.9E-02	1.5E-02	8.3E-03	1.1E-02	1.4E-02	4.3E-03	1.3E-02
NNW	1.2E-02	6.4E-03	3.5E-03	4.6E-03	6.0E-03	1.9E-03	5.4E-03
NW	1.0E-02	5.5E-03	3.1E-03	4.0E-03	5.2E-03	1.6E-03	4.7E-03
WNW	8.9E-03	4.7E-03	2.6E-03	3.4E-03	4.4E-03	1.4E-03	4.0E-03
W	1.3E-02	7.1E-03	3.9E-03	5.1E-03	6.6E-03	2.1E-03	6.0E-03
WSW	3.6E-02	1.9E-02	1.0E-02	1.3E-02	1.7E-02	5.2E-03	1.6E-02
SW	2.3E-02	1.2E-02	6.8E-03	8.8E-03	1.2E-02	3.5E-03	1.0E-02
SSW	3.1E-02	1.6E-02	8.7E-03	1.1E-02	1.5E-02	4.5E-03	1.4E-02
S	2.9E-02	1.5E-02	8.3E-03	1.1E-02	1.4E-02	4.3E-03	1.3E-02
SSE	2.8E-02	1.5E-02	7.9E-03	1.0E-02	1.4E-02	4.0E-03	1.2E-02
SE	2.6E-02	1.4E-02	7.6E-03	9.9E-03	1.3E-02	4.0E-03	1.2E-02
ESE	3.7E-02	1.9E-02	1.1E-02	1.4E-02	1.8E-02	5.4E-03	1.6E-02
E	2.5E-02	1.3E-02	7.4E-03	9.6E-03	1.3E-02	3.8E-03	1.1E-02
ENE	2.8E-02	1.5E-02	8.0E-03	1.0E-02	1.4E-02	4.1E-03	1.2E-02
NE	3.1E-02	1.6E-02	8.8E-03	1.1E-02	1.5E-02	4.5E-03	1.4E-02
NNE	5.8E-02	3.0E-02	1.7E-02	2.2E-02	2.8E-02	8.6E-03	2.6E-02

	Distance (m)						
Direction	1446	1683	1741	1383	1351	2254	1510
N	9.5E-03	7.4E-03	7.0E-03	1.0E-02	1.1E-02	4.6E-03	8.8E-03
NNW	4.0E-03	3.2E-03	3.0E-03	4.3E-03	4.5E-03	2.0E-03	3.8E-03
NW	3.5E-03	2.8E-03	2.6E-03	3.8E-03	3.9E-03	1.8E-03	3.3E-03
WNW	3.0E-03	2.4E-03	2.3E-03	3.2E-03	3.4E-03	1.5E-03	2.8E-03
W	4.5E-03	3.5E-03	3.3E-03	4.8E-03	5.0E-03	2.2E-03	4.2E-03
WSW	1.2E-02	9.1E-03	8.6E-03	1.3E-02	1.3E-02	5.7E-03	1.1E-02
SW	7.8E-03	6.1E-03	5.7E-03	8.3E-03	8.7E-03	3.8E-03	7.2E-03
SSW	1.0E-02	7.8E-03	7.4E-03	1.1E-02	1.1E-02	4.8E-03	9.4E-03
S	9.6E-03	7.5E-03	7.1E-03	1.0E-02	1.1E-02	4.6E-03	8.9E-03
SSE	9.1E-03	7.1E-03	6.7E-03	9.8E-03	1.0E-02	4.4E-03	8.4E-03
SE	8.7E-03	6.8E-03	6.5E-03	9.4E-03	9.7E-03	4.3E-03	8.1E-03
ESE	1.2E-02	9.4E-03	8.9E-03	1.3E-02	1.4E-02	5.8E-03	1.1E-02
E	8.5E-03	6.6E-03	6.3E-03	9.1E-03	9.5E-03	4.1E-03	7.9E-03
ENE	9.2E-03	7.1E-03	6.8E-03	9.9E-03	1.0E-02	4.4E-03	8.5E-03
NE	1.0E-02	7.9E-03	7.4E-03	1.1E-02	1.1E-02	4.9E-03	9.4E-03
NNE	1.9E-02	1.5E-02	1.4E-02	2.1E-02	2.1E-02	9.3E-03	1.8E-02

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	1.1E-02	2.4E-02
NNW	4.6E-03	1.0E-02
NW	4.0E-03	8.5E-03
WNW	3.4E-03	7.3E-03
W	5.1E-03	1.1E-02
WSW	1.3E-02	2.9E-02
SW	8.8E-03	1.9E-02
SSW	1.1E-02	2.6E-02
S	1.1E-02	2.4E-02
SSE	1.0E-02	2.3E-02
SE	9.9E-03	2.1E-02
ESE	1.4E-02	3.0E-02
E	9.6E-03	2.1E-02
ENE	1.0E-02	2.3E-02
NE	1.1E-02	2.5E-02
NNE	2.2E-02	4.7E-02

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	750	1089	1574	1339	1134	2370	1206
N	3.7E-07	1.9E-07	1.0E-07	1.4E-07	1.8E-07	5.3E-08	1.6E-07
NNW	1.6E-07	8.0E-08	4.4E-08	5.7E-08	7.5E-08	2.3E-08	6.8E-08
NW	1.3E-07	6.9E-08	3.8E-08	5.0E-08	6.5E-08	2.0E-08	5.9E-08
WNW	1.1E-07	5.9E-08	3.2E-08	4.2E-08	5.5E-08	1.7E-08	5.0E-08
W	1.7E-07	8.9E-08	4.9E-08	6.4E-08	8.3E-08	2.5E-08	7.5E-08
WSW	4.6E-07	2.4E-07	1.3E-07	1.7E-07	2.2E-07	6.5E-08	2.0E-07
SW	3.0E-07	1.6E-07	8.5E-08	1.1E-07	1.5E-07	4.3E-08	1.3E-07
SSW	4.0E-07	2.0E-07	1.1E-07	1.4E-07	1.9E-07	5.6E-08	1.7E-07
S	3.8E-07	1.9E-07	1.1E-07	1.4E-07	1.8E-07	5.3E-08	1.6E-07
SSE	3.6E-07	1.9E-07	9.9E-08	1.3E-07	1.7E-07	5.0E-08	1.6E-07
SE	3.3E-07	1.7E-07	9.6E-08	1.2E-07	1.6E-07	4.9E-08	1.5E-07
ESE	4.7E-07	2.5E-07	1.3E-07	1.7E-07	2.3E-07	6.7E-08	2.1E-07
E	3.2E-07	1.7E-07	9.3E-08	1.2E-07	1.6E-07	4.7E-08	1.4E-07
ENE	3.6E-07	1.9E-07	1.0E-07	1.3E-07	1.7E-07	5.1E-08	1.6E-07
NE	4.0E-07	2.0E-07	1.1E-07	1.5E-07	1.9E-07	5.6E-08	1.7E-07
NNE	7.4E-07	3.9E-07	2.1E-07	2.8E-07	3.6E-07	1.1E-07	3.3E-07

	Distance (m)						
Direction	1446	1683	1741	1383	1351	2254	1510
N	1.2E-07	9.3E-08	8.8E-08	1.3E-07	1.3E-07	5.7E-08	1.1E-07
NNW	5.0E-08	3.9E-08	3.7E-08	5.4E-08	5.6E-08	2.4E-08	4.7E-08
NW	4.4E-08	3.4E-08	3.2E-08	4.7E-08	4.9E-08	2.1E-08	4.1E-08
WNW	3.7E-08	2.9E-08	2.8E-08	4.0E-08	4.2E-08	1.8E-08	3.5E-08
W	5.6E-08	4.4E-08	4.1E-08	6.0E-08	6.3E-08	2.7E-08	5.2E-08
WSW	1.5E-07	1.2E-07	1.1E-07	1.6E-07	1.7E-07	7.1E-08	1.4E-07
SW	9.8E-08	7.6E-08	7.2E-08	1.1E-07	1.1E-07	4.7E-08	9.1E-08
SSW	1.3E-07	9.9E-08	9.3E-08	1.4E-07	1.4E-07	6.0E-08	1.2E-07
S	1.2E-07	9.4E-08	8.9E-08	1.3E-07	1.4E-07	5.8E-08	1.1E-07
SSE	1.1E-07	8.9E-08	8.4E-08	1.2E-07	1.3E-07	5.4E-08	1.1E-07
SE	1.1E-07	8.6E-08	8.2E-08	1.2E-07	1.2E-07	5.4E-08	1.0E-07
ESE	1.5E-07	1.2E-07	1.1E-07	1.6E-07	1.7E-07	7.3E-08	1.4E-07
E	1.1E-07	8.3E-08	7.9E-08	1.2E-07	1.2E-07	5.1E-08	1.0E-07
ENE	1.2E-07	9.0E-08	8.5E-08	1.2E-07	1.3E-07	5.5E-08	1.1E-07
NE	1.3E-07	9.9E-08	9.4E-08	1.4E-07	1.4E-07	6.1E-08	1.2E-07
NNE	2.4E-07	1.9E-07	1.8E-07	2.6E-07	2.7E-07	1.2E-07	2.3E-07

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	1.4E-07	3.0E-07
NNW	5.7E-08	1.3E-07
NW	5.0E-08	1.1E-07
WNW	4.2E-08	9.2E-08
W	6.4E-08	1.4E-07
WSW	1.7E-07	3.7E-07
SW	1.1E-07	2.4E-07
SSW	1.4E-07	3.3E-07
S	1.4E-07	3.1E-07
SSE	1.3E-07	2.9E-07
SE	1.2E-07	2.7E-07
ESE	1.7E-07	3.9E-07
E	1.2E-07	2.7E-07
ENE	1.3E-07	2.9E-07
NE	1.5E-07	3.2E-07
NNE	2.8E-07	6.1E-07

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Apr 27, 2000 8:28 am

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Effective Dose Equivalent (mrem/year)
5.78E-02

At This Location: 750 Meters North Northeast
Source Category: DOE Facility - Remediation
Source Type: Stack
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS, Area Ventilation System

Dataset Name: BLDG56REPKG.AVS
Dataset Date: Apr 27, 2000 8:28 am
Wind File: WNDFILES\FEMPSTD.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 750 Meters North Northeast
Lifetime Fatal Cancer Risk: 7.38E-07

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	1.05E-04
BREAST	1.20E-04
R MAR	6.05E-03
LUNGS	4.49E-01
THYROID	1.02E-04
ENDOST	7.89E-02
RMNDR	2.62E-03
EFFEC	5.78E-02

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
U-234	Y	0.30	2.7E-04	2.7E-04
U-235	Y	1.00	1.5E-05	1.5E-05
U-236	Y	1.00	1.1E-05	1.1E-05
U-238	Y	0.30	3.1E-04	3.1E-04
TH-230	Y	0.30	2.4E-05	2.4E-05

SITE INFORMATION

Temperature: 12 degrees C
Precipitation: 102 cm/y
Mixing Height: 950 m

SOURCE INFORMATION

Source Number:	1
Stack Height (m):	3.00
Diameter (m):	0.31
Plume Rise Momentum (m/s): (Exit Velocity)	7.70E+00

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

750	1089	1574	1339	1134	2370	1206	1446	1683	1741
1383	1351	2254	1510	1339	839				

ATTACHMENT 2

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
May 22, 2000 2:22 pm

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Source Category: DOE Facility - Remediation
Source Type: Area
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS,
BUILDING 56 - Vacuum Systems (3)

Dataset Name: BLDG56.VACSYS
Dataset Date: May 22, 2000 2:22 pm
Wind File: WNDFILES\FEMPSTD.WND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	3.23E+00
BREAST	3.69E+00
R MAR	1.85E+02
LUNGS	1.37E+04
THYROID	3.15E+00
ENDOST	2.42E+03
RMNDR	8.06E+01
EFFEC	1.76E+03

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	5.76E+01
INHALATION	1.70E+03
AIR IMMERSION	1.73E-05
GROUND SURFACE	6.44E-01
INTERNAL	1.76E+03
EXTERNAL	6.44E-01
TOTAL	1.76E+03

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-234	7.99E+02
U-235	2.37E+01
U-236	1.73E+01
U-238	7.94E+02
TH-230	1.27E+02
TOTAL	1.76E+03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	1.74E-04
BONE	1.15E-04
THYROID	7.22E-07
BREAST	8.18E-06
LUNG	2.20E-02
STOMACH	4.77E-06
BOWEL	6.58E-06
LIVER	7.17E-06
PANCREAS	3.15E-06
URINARY	1.72E-04
OTHER	3.86E-06
TOTAL	2.25E-02

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	3.02E-04
INHALATION	2.22E-02
AIR IMMERSION	4.02E-10
GROUND SURFACE	1.48E-05
INTERNAL	2.25E-02
EXTERNAL	1.48E-05
TOTAL	2.25E-02

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-234	1.04E-02
U-235	3.11E-04
U-236	2.23E-04
U-238	1.05E-02
TH-230	1.07E-03
TOTAL	2.25E-02

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m) 750	1089	1574	1339	1134	2370	1206
N	9.1E+02	4.8E+02	2.6E+02	3.4E+02	4.5E+02	1.4E+02	4.1E+02
NNW	3.9E+02	2.0E+02	1.1E+02	1.5E+02	1.9E+02	6.0E+01	1.7E+02
NW	3.2E+02	1.7E+02	9.8E+01	1.3E+02	1.6E+02	5.3E+01	1.5E+02
WNW	2.8E+02	1.5E+02	8.4E+01	1.1E+02	1.4E+02	4.5E+01	1.3E+02
W	4.0E+02	2.2E+02	1.2E+02	1.6E+02	2.1E+02	6.6E+01	1.9E+02
WSW	1.1E+03	5.9E+02	3.3E+02	4.2E+02	5.5E+02	1.7E+02	5.0E+02
SW	7.2E+02	3.9E+02	2.1E+02	2.8E+02	3.6E+02	1.1E+02	3.3E+02
SSW	1.0E+03	5.2E+02	2.8E+02	3.7E+02	4.8E+02	1.4E+02	4.4E+02
S	9.2E+02	4.8E+02	2.7E+02	3.5E+02	4.5E+02	1.4E+02	4.1E+02
SSE	8.9E+02	4.6E+02	2.5E+02	3.3E+02	4.3E+02	1.3E+02	3.9E+02
SE	7.7E+02	4.2E+02	2.4E+02	3.1E+02	4.0E+02	1.3E+02	3.6E+02
ESE	1.1E+03	6.1E+02	3.3E+02	4.3E+02	5.7E+02	1.7E+02	5.1E+02
E	7.8E+02	4.2E+02	2.3E+02	3.0E+02	3.9E+02	1.2E+02	3.6E+02
ENE	8.8E+02	4.6E+02	2.5E+02	3.3E+02	4.3E+02	1.3E+02	3.9E+02
NE	9.8E+02	5.1E+02	2.8E+02	3.7E+02	4.8E+02	1.4E+02	4.3E+02
NNE	1.8E+03	9.4E+02	5.3E+02	6.8E+02	8.9E+02	2.7E+02	8.0E+02

Direction	Distance (m) 1446	1683	1741	1383	1351	2254	1510
N	3.0E+02	2.4E+02	2.2E+02	3.2E+02	3.4E+02	1.5E+02	2.8E+02
NNW	1.3E+02	1.0E+02	9.6E+01	1.4E+02	1.4E+02	6.5E+01	1.2E+02
NW	1.1E+02	8.8E+01	8.4E+01	1.2E+02	1.2E+02	5.7E+01	1.0E+02
WNW	9.6E+01	7.6E+01	7.2E+01	1.0E+02	1.1E+02	4.9E+01	9.0E+01
W	1.4E+02	1.1E+02	1.1E+02	1.5E+02	1.6E+02	7.1E+01	1.3E+02
WSW	3.7E+02	2.9E+02	2.8E+02	4.0E+02	4.2E+02	1.8E+02	3.5E+02
SW	2.5E+02	1.9E+02	1.8E+02	2.6E+02	2.7E+02	1.2E+02	2.3E+02
SSW	3.2E+02	2.5E+02	2.4E+02	3.5E+02	3.6E+02	1.6E+02	3.0E+02
S	3.1E+02	2.4E+02	2.3E+02	3.3E+02	3.4E+02	1.5E+02	2.8E+02
SSE	2.9E+02	2.3E+02	2.1E+02	3.1E+02	3.2E+02	1.4E+02	2.7E+02
SE	2.7E+02	2.2E+02	2.0E+02	2.9E+02	3.0E+02	1.4E+02	2.6E+02
ESE	3.8E+02	3.0E+02	2.8E+02	4.1E+02	4.3E+02	1.9E+02	3.6E+02
E	2.7E+02	2.1E+02	2.0E+02	2.9E+02	3.0E+02	1.3E+02	2.5E+02
ENE	2.9E+02	2.3E+02	2.2E+02	3.1E+02	3.3E+02	1.4E+02	2.7E+02
NE	3.2E+02	2.5E+02	2.4E+02	3.5E+02	3.6E+02	1.6E+02	3.0E+02
NNE	6.0E+02	4.7E+02	4.5E+02	6.5E+02	6.7E+02	3.0E+02	5.6E+02

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	3.4E+02	7.5E+02
NNW	1.5E+02	3.2E+02
NW	1.3E+02	2.6E+02
WNW	1.1E+02	2.3E+02
W	1.6E+02	3.3E+02
WSW	4.2E+02	9.2E+02
SW	2.8E+02	6.0E+02
SSW	3.7E+02	8.2E+02
S	3.5E+02	7.6E+02
SSE	3.3E+02	7.3E+02
SE	3.1E+02	6.4E+02
ESE	4.3E+02	9.4E+02
E	3.0E+02	6.5E+02
ENE	3.3E+02	7.3E+02
NE	3.7E+02	8.0E+02
NNE	6.8E+02	1.5E+03

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Direction	Distance (m) 750	1089	1574	1339	1134	2370	1206
N	1.2E-02	6.1E-03	3.3E-03	4.3E-03	5.7E-03	1.7E-03	5.1E-03
NNW	4.9E-03	2.6E-03	1.4E-03	1.8E-03	2.4E-03	7.2E-04	2.2E-03
NW	4.0E-03	2.2E-03	1.2E-03	1.6E-03	2.0E-03	6.3E-04	1.8E-03
WNW	3.5E-03	1.9E-03	1.0E-03	1.3E-03	1.8E-03	5.4E-04	1.6E-03
W	5.1E-03	2.8E-03	1.5E-03	2.0E-03	2.6E-03	8.0E-04	2.4E-03
WSW	1.4E-02	7.5E-03	4.1E-03	5.4E-03	7.0E-03	2.1E-03	6.4E-03
SW	9.2E-03	4.9E-03	2.7E-03	3.5E-03	4.6E-03	1.4E-03	4.2E-03
SSW	1.3E-02	6.6E-03	3.5E-03	4.6E-03	6.1E-03	1.8E-03	5.5E-03
S	1.2E-02	6.1E-03	3.4E-03	4.4E-03	5.8E-03	1.7E-03	5.2E-03
SSE	1.1E-02	5.9E-03	3.2E-03	4.2E-03	5.5E-03	1.6E-03	5.0E-03
SE	9.7E-03	5.4E-03	3.0E-03	3.9E-03	5.0E-03	1.6E-03	4.6E-03
ESE	1.5E-02	7.7E-03	4.2E-03	5.5E-03	7.2E-03	2.2E-03	6.5E-03
E	1.0E-02	5.3E-03	2.9E-03	3.8E-03	5.0E-03	1.5E-03	4.5E-03
ENE	1.1E-02	5.9E-03	3.2E-03	4.2E-03	5.5E-03	1.6E-03	5.0E-03
NE	1.2E-02	6.5E-03	3.5E-03	4.6E-03	6.1E-03	1.8E-03	5.5E-03
NNE	2.2E-02	1.2E-02	6.7E-03	8.7E-03	1.1E-02	3.4E-03	1.0E-02

Direction	Distance (m) 1446	1683	1741	1383	1351	2254	1510
N	3.8E-03	3.0E-03	2.8E-03	4.1E-03	4.3E-03	1.8E-03	3.6E-03
NNW	1.6E-03	1.3E-03	1.2E-03	1.7E-03	1.8E-03	7.9E-04	1.5E-03
NW	1.4E-03	1.1E-03	1.0E-03	1.5E-03	1.5E-03	6.9E-04	1.3E-03
WNW	1.2E-03	9.3E-04	8.8E-04	1.3E-03	1.3E-03	5.9E-04	1.1E-03
W	1.8E-03	1.4E-03	1.3E-03	1.9E-03	2.0E-03	8.7E-04	1.6E-03
WSW	4.7E-03	3.7E-03	3.5E-03	5.1E-03	5.3E-03	2.3E-03	4.4E-03
SW	3.1E-03	2.4E-03	2.3E-03	3.3E-03	3.5E-03	1.5E-03	2.9E-03
SSW	4.1E-03	3.2E-03	3.0E-03	4.4E-03	4.6E-03	1.9E-03	3.8E-03
S	3.9E-03	3.0E-03	2.8E-03	4.2E-03	4.3E-03	1.9E-03	3.6E-03
SSE	3.7E-03	2.8E-03	2.7E-03	3.9E-03	4.1E-03	1.7E-03	3.4E-03
SE	3.4E-03	2.7E-03	2.6E-03	3.7E-03	3.8E-03	1.7E-03	3.2E-03
ESE	4.8E-03	3.8E-03	3.6E-03	5.2E-03	5.4E-03	2.3E-03	4.5E-03
E	3.4E-03	2.6E-03	2.5E-03	3.6E-03	3.8E-03	1.6E-03	3.1E-03
ENE	3.7E-03	2.9E-03	2.7E-03	4.0E-03	4.1E-03	1.8E-03	3.4E-03
NE	4.1E-03	3.2E-03	3.0E-03	4.4E-03	4.6E-03	2.0E-03	3.8E-03
NNE	7.7E-03	6.0E-03	5.7E-03	8.2E-03	8.5E-03	3.7E-03	7.1E-03

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	4.3E-03	9.5E-03
NNW	1.8E-03	4.0E-03
NW	1.6E-03	3.3E-03
WNW	1.3E-03	2.9E-03
W	2.0E-03	4.2E-03
WSW	5.4E-03	1.2E-02
SW	3.5E-03	7.6E-03
SSW	4.6E-03	1.0E-02
S	4.4E-03	9.6E-03
SSE	4.2E-03	9.3E-03
SE	3.9E-03	8.1E-03
ESE	5.5E-03	1.2E-02
E	3.8E-03	8.3E-03
ENE	4.2E-03	9.2E-03
NE	4.6E-03	1.0E-02
NNE	8.7E-03	1.9E-02

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
May 22, 2000 2:22 pm

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Effective Dose Equivalent
(mrem/year)

1.76E+03

At This Location: 750 Meters North Northeast
Source Category: DOE Facility - Remediation
Source Type: Area
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS,
BUILDING 56 - Vacuum Systems (3)

Dataset Name: BLDG56.VACSYS
Dataset Date: May 22, 2000 2:22 pm
Wind File: WNDFILES\FEMPSTD.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 750 Meters North Northeast
Lifetime Fatal Cancer Risk: 2.25E-02

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	3.23E+00
BREAST	3.69E+00
R MAR	1.85E+02
LUNGS	1.37E+04
THYROID	3.15E+00
ENDOST	2.42E+03
RMNDR	8.06E+01
EFFEC	1.76E+03

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
U-234	Y	0.30	8.9E+00	8.9E+00
U-235	Y	1.00	4.7E-01	4.7E-01
U-236	Y	1.00	3.4E-01	3.4E-01
U-238	Y	0.30	9.9E+00	9.9E+00
TH-230	Y	0.30	7.8E-01	7.8E-01

SITE INFORMATION

Temperature:	12 degrees C
Precipitation:	102 cm/y
Mixing Height:	950 m

SOURCE INFORMATION

Source Number: 1

Source Height (m): 5.00
Area (sq m): 4.65E+02

Plume Rise
Momentum (m/s): 1.00E+00
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

750	1089	1574	1339	1134	2370	1206	1446	1683	1741
1383	1351	2254	1510	1339	839				

ATTACHMENT 3

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Jun 28, 2000 6:56 am

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Effective Dose Equivalent
(mrem/year)

6.12E-02

At This Location: 750 Meters North Northeast
Source Category: DOE Facility - Remediation
Source Type: Area
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS,
BUILDING 56 - Booth Ventilation

Dataset Name: B56.booths2
Dataset Date: Jun 28, 2000 6:56 am
Wind File: WNDFILES\FEMPSTD.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 750 Meters North Northeast
Lifetime Fatal Cancer Risk: 7.81E-07

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	1.13E-04
BREAST	1.28E-04
R MAR	6.43E-03
LUNGS	4.75E-01
THYROID	1.10E-04
ENDOST	8.39E-02
RMNDR	2.80E-03
EFFEC	6.12E-02

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
U-234	Y	0.30	3.1E-04	3.1E-04
U-235	Y	1.00	1.6E-05	1.6E-05
U-236	Y	1.00	1.2E-05	1.2E-05
U-238	Y	0.30	3.4E-04	3.4E-04
TH-230	Y	0.30	2.7E-05	2.7E-05
PU-239	Y	1.00	4.9E-08	4.9E-08

SITE INFORMATION

Temperature: 12 degrees C
Precipitation: 102 cm/y
Mixing Height: 950 m

SOURCE INFORMATION

Source Number: 1

Source Height (m): 5.00
Area (sq m): 4.65E+02

Plume Rise
Momentum (m/s): 1.00E+00
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

750	1089	1574	1339	1134	2370	1206	1446	1683	1741
1383	1351	2254	1510	1339	839				

CAP88-PC

Version 1.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment
Jun 28, 2000 6:56 am

Facility: Fernald Environmental Management Project
Address: 7400 Willey Road
City: Fernald
State: OH Zip: 45013

Source Category: DOE Facility - Remediation
Source Type: Area
Emission Year: 2000

Comments: REPACKAGING > 1% U235 COMPOUNDS,
BUILDING 56 - Booth Ventilation

Dataset Name: B56.booths2
Dataset Date: Jun 28, 2000 6:56 am
Wind File: WNDFILES\FEMPSTD.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 750 Meters North Northeast
Lifetime Fatal Cancer Risk: 7.81E-07

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	1.13E-04
BREAST	1.28E-04
R MAR	6.43E-03
LUNGS	4.75E-01
THYROID	1.10E-04
ENDOST	8.39E-02
RMNDR	2.80E-03
EFFEC	6.12E-02

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
U-234	Y	0.30	3.1E-04	3.1E-04
U-235	Y	1.00	1.6E-05	1.6E-05
U-236	Y	1.00	1.2E-05	1.2E-05
U-238	Y	0.30	3.4E-04	3.4E-04
TH-230	Y	0.30	2.7E-05	2.7E-05
PU-239	Y	1.00	4.9E-08	4.9E-08

SITE INFORMATION

Temperature: 12 degrees C
Precipitation: 102 cm/y
Mixing Height: 950 m

SOURCE INFORMATION

Source Number: 1

Source Height (m): 5.00
Area (sq m): 4.65E+02

Plume Rise
Momentum (m/s): 1.00E+00
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.700	0.399	0.442
Fraction From Assessment Area:	0.300	0.601	0.558
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

750	1089	1574	1339	1134	2370	1206	1446	1683	1741
1383	1351	2254	1510	1339	839				

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
GONADS	1.13E-04
BREAST	1.28E-04
R MAR	6.43E-03
LUNGS	4.75E-01
THYROID	1.10E-04
ENDOST	8.39E-02
RMNDR	2.80E-03
EFFEC	6.12E-02

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.00E-03
INHALATION	5.91E-02
AIR IMMERSION	6.01E-10
GROUND SURFACE	2.24E-05
INTERNAL	6.11E-02
EXTERNAL	2.24E-05
TOTAL	6.12E-02

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-234	2.77E-02
U-235	8.24E-04
U-236	6.00E-04
U-238	2.76E-02
TH-230	4.41E-03
PU-239	6.89E-06
TOTAL	6.12E-02

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
LEUKEMIA	6.04E-09
BONE	3.99E-09
THYROID	2.51E-11
BREAST	2.84E-10
LUNG	7.64E-07
STOMACH	1.66E-10
BOWEL	2.29E-10
LIVER	2.59E-10
PANCREAS	1.10E-10
URINARY	5.99E-09
OTHER	1.34E-10
TOTAL	7.81E-07

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.05E-08
INHALATION	7.70E-07
AIR IMMERSION	1.40E-14
GROUND SURFACE	5.15E-10
INTERNAL	7.81E-07
EXTERNAL	5.15E-10
TOTAL	7.81E-07

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-234	3.62E-07
U-235	1.08E-08
U-236	7.71E-09
U-238	3.63E-07
TH-230	3.70E-08
PU-239	5.40E-11
TOTAL	7.81E-07

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m) 750	1089	1574	1339	1134	2370	1206
N	3.2E-02	1.7E-02	9.2E-03	1.2E-02	1.6E-02	4.7E-03	1.4E-02
NNW	1.3E-02	7.1E-03	3.9E-03	5.1E-03	6.6E-03	2.1E-03	6.0E-03
NW	1.1E-02	6.0E-03	3.4E-03	4.4E-03	5.6E-03	1.8E-03	5.1E-03
WNW	9.7E-03	5.2E-03	2.9E-03	3.8E-03	4.9E-03	1.6E-03	4.4E-03
W	1.4E-02	7.6E-03	4.3E-03	5.5E-03	7.2E-03	2.3E-03	6.5E-03
WSW	3.9E-02	2.1E-02	1.1E-02	1.5E-02	1.9E-02	5.8E-03	1.7E-02
SW	2.5E-02	1.3E-02	7.5E-03	9.7E-03	1.3E-02	3.9E-03	1.1E-02
SSW	3.5E-02	1.8E-02	9.8E-03	1.3E-02	1.7E-02	5.0E-03	1.5E-02
S	3.2E-02	1.7E-02	9.2E-03	1.2E-02	1.6E-02	4.8E-03	1.4E-02
SSE	3.1E-02	1.6E-02	8.8E-03	1.1E-02	1.5E-02	4.5E-03	1.4E-02
SE	2.7E-02	1.5E-02	8.3E-03	1.1E-02	1.4E-02	4.4E-03	1.3E-02
ESE	4.0E-02	2.1E-02	1.2E-02	1.5E-02	2.0E-02	6.0E-03	1.8E-02
E	2.7E-02	1.5E-02	8.1E-03	1.1E-02	1.4E-02	4.2E-03	1.2E-02
ENE	3.1E-02	1.6E-02	8.9E-03	1.2E-02	1.5E-02	4.6E-03	1.4E-02
NE	3.4E-02	1.8E-02	9.8E-03	1.3E-02	1.7E-02	5.0E-03	1.5E-02
NNE	6.1E-02	3.3E-02	1.8E-02	2.4E-02	3.1E-02	9.5E-03	2.8E-02

Direction	Distance (m) 1446	1683	1741	1383	1351	2254	1510
N	1.0E-02	8.2E-03	7.8E-03	1.1E-02	1.2E-02	5.1E-03	9.8E-03
NNW	4.5E-03	3.5E-03	3.4E-03	4.8E-03	5.0E-03	2.2E-03	4.2E-03
NW	3.9E-03	3.1E-03	2.9E-03	4.1E-03	4.3E-03	2.0E-03	3.6E-03
WNW	3.3E-03	2.6E-03	2.5E-03	3.6E-03	3.7E-03	1.7E-03	3.1E-03
W	4.9E-03	3.9E-03	3.7E-03	5.3E-03	5.5E-03	2.5E-03	4.6E-03
WSW	1.3E-02	1.0E-02	9.6E-03	1.4E-02	1.4E-02	6.3E-03	1.2E-02
SW	8.5E-03	6.7E-03	6.3E-03	9.2E-03	9.5E-03	4.2E-03	8.0E-03
SSW	1.1E-02	8.7E-03	8.3E-03	1.2E-02	1.3E-02	5.4E-03	1.0E-02
S	1.1E-02	8.3E-03	7.8E-03	1.1E-02	1.2E-02	5.2E-03	9.9E-03
SSE	1.0E-02	7.8E-03	7.4E-03	1.1E-02	1.1E-02	4.9E-03	9.4E-03
SE	9.5E-03	7.5E-03	7.1E-03	1.0E-02	1.1E-02	4.7E-03	8.9E-03
ESE	1.3E-02	1.0E-02	9.8E-03	1.4E-02	1.5E-02	6.5E-03	1.2E-02
E	9.3E-03	7.3E-03	6.9E-03	1.0E-02	1.0E-02	4.6E-03	8.7E-03
ENE	1.0E-02	7.9E-03	7.5E-03	1.1E-02	1.1E-02	5.0E-03	9.5E-03
NE	1.1E-02	8.7E-03	8.3E-03	1.2E-02	1.3E-02	5.4E-03	1.0E-02
NNE	2.1E-02	1.6E-02	1.6E-02	2.2E-02	2.3E-02	1.0E-02	2.0E-02

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	1.2E-02	2.6E-02
NNW	5.1E-03	1.1E-02
NW	4.4E-03	9.1E-03
WNW	3.8E-03	8.0E-03
W	5.5E-03	1.2E-02
WSW	1.5E-02	3.2E-02
SW	9.7E-03	2.1E-02
SSW	1.3E-02	2.8E-02
S	1.2E-02	2.6E-02
SSE	1.1E-02	2.5E-02
SE	1.1E-02	2.2E-02
ESE	1.5E-02	3.3E-02
E	1.1E-02	2.3E-02
ENE	1.2E-02	2.5E-02
NE	1.3E-02	2.8E-02
NNE	2.4E-02	5.1E-02

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Direction	Distance (m) 750	1089	1574	1339	1134	2370	1206
N	4.0E-07	2.1E-07	1.2E-07	1.5E-07	2.0E-07	5.9E-08	1.8E-07
NNW	1.7E-07	8.9E-08	4.9E-08	6.3E-08	8.3E-08	2.5E-08	7.5E-08
NW	1.4E-07	7.5E-08	4.2E-08	5.4E-08	7.1E-08	2.2E-08	6.4E-08
WNW	1.2E-07	6.5E-08	3.6E-08	4.7E-08	6.1E-08	1.9E-08	5.5E-08
W	1.8E-07	9.6E-08	5.4E-08	6.9E-08	9.0E-08	2.8E-08	8.2E-08
WSW	5.0E-07	2.6E-07	1.4E-07	1.9E-07	2.4E-07	7.3E-08	2.2E-07
SW	3.2E-07	1.7E-07	9.4E-08	1.2E-07	1.6E-07	4.8E-08	1.4E-07
SSW	4.4E-07	2.3E-07	1.2E-07	1.6E-07	2.1E-07	6.2E-08	1.9E-07
S	4.1E-07	2.1E-07	1.2E-07	1.5E-07	2.0E-07	5.9E-08	1.8E-07
SSE	3.9E-07	2.0E-07	1.1E-07	1.4E-07	1.9E-07	5.6E-08	1.7E-07
SE	3.4E-07	1.9E-07	1.0E-07	1.4E-07	1.8E-07	5.4E-08	1.6E-07
ESE	5.0E-07	2.7E-07	1.5E-07	1.9E-07	2.5E-07	7.5E-08	2.3E-07
E	3.5E-07	1.9E-07	1.0E-07	1.3E-07	1.7E-07	5.2E-08	1.6E-07
ENE	3.9E-07	2.0E-07	1.1E-07	1.5E-07	1.9E-07	5.7E-08	1.7E-07
NE	4.3E-07	2.3E-07	1.2E-07	1.6E-07	2.1E-07	6.3E-08	1.9E-07
NNE	7.8E-07	4.2E-07	2.3E-07	3.0E-07	3.9E-07	1.2E-07	3.6E-07

Direction	Distance (m) 1446	1683	1741	1383	1351	2254	1510
N	1.3E-07	1.0E-07	9.8E-08	1.4E-07	1.5E-07	6.4E-08	1.2E-07
NNW	5.6E-08	4.4E-08	4.1E-08	6.0E-08	6.3E-08	2.7E-08	5.2E-08
NW	4.8E-08	3.8E-08	3.6E-08	5.2E-08	5.4E-08	2.4E-08	4.5E-08
WNW	4.1E-08	3.2E-08	3.1E-08	4.4E-08	4.6E-08	2.0E-08	3.9E-08
W	6.1E-08	4.8E-08	4.6E-08	6.6E-08	6.8E-08	3.0E-08	5.7E-08
WSW	1.6E-07	1.3E-07	1.2E-07	1.8E-07	1.8E-07	7.9E-08	1.5E-07
SW	1.1E-07	8.4E-08	8.0E-08	1.2E-07	1.2E-07	5.2E-08	1.0E-07
SSW	1.4E-07	1.1E-07	1.0E-07	1.5E-07	1.6E-07	6.8E-08	1.3E-07
S	1.3E-07	1.0E-07	9.9E-08	1.4E-07	1.5E-07	6.5E-08	1.2E-07
SSE	1.3E-07	9.9E-08	9.3E-08	1.4E-07	1.4E-07	6.0E-08	1.2E-07
SE	1.2E-07	9.4E-08	8.9E-08	1.3E-07	1.3E-07	5.9E-08	1.1E-07
ESE	1.7E-07	1.3E-07	1.2E-07	1.8E-07	1.9E-07	8.1E-08	1.6E-07
E	1.2E-07	9.2E-08	8.7E-08	1.3E-07	1.3E-07	5.7E-08	1.1E-07
ENE	1.3E-07	1.0E-07	9.4E-08	1.4E-07	1.4E-07	6.2E-08	1.2E-07
NE	1.4E-07	1.1E-07	1.0E-07	1.5E-07	1.6E-07	6.8E-08	1.3E-07
NNE	2.7E-07	2.1E-07	2.0E-07	2.9E-07	3.0E-07	1.3E-07	2.5E-07

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)	
Direction	1339	839
N	1.5E-07	3.3E-07
NNW	6.3E-08	1.4E-07
NW	5.4E-08	1.2E-07
WNW	4.7E-08	1.0E-07
W	6.9E-08	1.5E-07
WSW	1.9E-07	4.1E-07
SW	1.2E-07	2.6E-07
SSW	1.6E-07	3.6E-07
S	1.5E-07	3.3E-07
SSE	1.4E-07	3.2E-07
SE	1.4E-07	2.8E-07
ESE	1.9E-07	4.2E-07
E	1.3E-07	2.9E-07
ENE	1.5E-07	3.2E-07
NE	1.6E-07	3.6E-07
NNE	3.0E-07	6.5E-07

ATTACHMENT 4