

BBNPP Information Submittal T-1:

Please make available detailed input and output data for all TRAGIS and RADTRAN analyses.

Response:

The TRAGIS and RADTRAN code case summaries supporting ER Sections 5.11 and 7.4 are attached:

SUPPORTING TRAGIS & RADTRAN CASE SUMMARIES FOR ER SECTION 5.11 FOR
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SUPPORTING TRAGIS & RADTRAN CASE SUMMARIES FOR ER SECTION 5.11 FOR BBNPP:

TRAGIS BBNPP CASE: UNIRRADATED FUEL

TRAGIS Routing Engine Version 1.5.4 -- Highway Data Network 4.0

FROM: RICHLAND WA Leaving : 06/09/08 13:26
 TO : SUSQUEHANNA NP PA Arriving : 06/11/08 14:07

Routing parameters used to calculate the route-

Routing type: Commercial with 2 driver(s)
 Time bias: 0.70 Mile bias: 0.30, Toll bias: 1.00

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		RICHLAND			WA	0.0	0:00	06/09/08	13:26
10.1	S240	KENNEWICK	NW	U395S240	WA	10.1	0:13	06/09/08	13:39
5.8	U395	KENNEWICK	SW	I82 X113	WA	15.9	0:21	06/09/08	13:47
19.1	I82	PLYMOUTH		I82 X131	WA	35.0	0:40	06/09/08	14:06
0.7	I82	crossing state border		OR/WA	BD	35.6	0:41	06/09/08	14:07
10.6	I82	HERMISTON	SW	I82 I84	OR	46.2	0:52	06/09/08	14:18
		Rest 30 minutes							
196.6	I84	ONTARIO	E	I84 X376	OR	242.8	4:57	06/09/08	19:23
1.3	I84	crossing state border		ID/OR	BD	244.1	4:58	06/09/08	19:24
		Rest 30 minutes							
221.6	I84	RAFT RIVER	W	I84 I86	ID	465.7	8:53	06/09/08	23:19
54.0	I84	crossing state border		ID/UT	BD	519.7	9:43	06/10/08	00:09
41.8	I84	TREMONTON	W	I15 I84	UT	561.5	10:18	06/10/08	00:44
39.4	I15	OGDEN	S	I15 I84	UT	600.9	10:52	06/10/08	01:18
38.5	I84	ECHO		I80 I84	UT	639.5	11:23	06/10/08	01:49
29.4	I80	crossing state border		UT/WY	BD	668.9	11:47	06/10/08	02:13
		Rest 30 minutes							
		Rest 30 minutes							
360.1	I80	CHEYENNE	S	I80 X362	WY	1028.9	17:35	06/10/08	08:01
40.5	I80	crossing state border		NE/WY	BD	1069.4	18:07	06/10/08	08:33
		Rest 30 minutes							
450.5	I80	OMAHA	S	I80 X453	NE	1520.0	24:41	06/10/08	16:07
2.2	I80	crossing state border		IA/NE	BD	1522.1	24:43	06/10/08	16:09
0.9	I80	COUNCIL BLUFFS	SW	I29 I80	IA	1523.0	24:44	06/10/08	16:10
2.8	I29	COUNCIL BLUFFS	SE	I29 I80	IA	1525.8	24:47	06/10/08	16:13
		Rest 30 minutes							
119.5	I80	DES MOINES	W	I235I35	IA	1645.3	27:08	06/10/08	18:34
14.2	I35	DES MOINES	N	I235I35	IA	1659.5	27:22	06/10/08	18:48
		Rest 30 minutes							
167.6	I80	LE CLAIRE	SW	I80 X306	IA	1827.1	30:27	06/10/08	21:53
0.4	I80	crossing state border		IA/IL	BD	1827.4	30:28	06/10/08	21:54
154.7	I80	HOMWOOD	NW	I294I80	IL	1982.1	33:16	06/11/08	00:42
4.9	I294\$	I80 \$ LANSING	W	I294I94	IL	1987.1	33:22	06/11/08	00:48
3.0	I80	I94	crossing state border	IL/IN	BD	1990.0	33:25	06/11/08	00:51
		Rest 30 minutes							
15.4	I80	I94	LAKE STATION	NE I80 I94	IN	2005.4	34:11	06/11/08	01:37
0.5	I80	PORTAGE	W	I80 I90	IN	2005.9	34:12	06/11/08	01:38
122.2	I80 \$	I90 \$ JAMESTOWN	SE	I69 I80	IN	2128.1	36:14	06/11/08	03:40
13.2	I80 \$	I90 \$	crossing state border	IN/OH	BD	2141.3	36:27	06/11/08	03:53
		Rest 30 minutes							
141.8	I80 \$	I90 \$ ELYRIA	NW	I80 I90	OH	2283.0	39:32	06/11/08	07:58
76.0	I80 \$	NORTH JACKSON	NE	I76 I80	OH	2359.0	40:55	06/11/08	09:21
15.2	I80	HUBBARD	N	I80 X234	OH	2374.2	41:12	06/11/08	09:38
2.7	I80	crossing state border		OH/PA	BD	2376.9	41:14	06/11/08	09:40

Rest 30 minutes
 239.4 I80 LIME RIDGE NE I80 X241 PA 2616.3 45:27 06/11/08 13:53
 12.1 U11 SUSQUEHANNA NP PA 2628.4 45:41 06/11/08 14:07

Total elapsed time: 45:41 Total trip mileage: 2628.4 Impedance: 2497.7

Mileage by State :

IA: 305.3 ID: 275.6 IL: 162.6 IN: 151.2 NE: 452.7 OH: 235.7
 OR: 208.5 PA: 251.5 UT: 149.1 WA: 35.6 WY: 400.5

Mileage by Sign Type:

1-INTERSTATE: 2600.4 2-US: 18.0 3-STATE: 10.1

Mileage by Lane Type:

1-Multi-Lane Controlled Access: 2607.7 3-Multi-Lane Divided Highway: 5.8
 5-Principle Road: 14.9

Mileage by Tribal Lands:

Total Outside Tribal Lands : 2601.6
 Total Inside Tribal Lands : 26.9

Umatilla Reservation : 26.9

TRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:

FROM: RICHLAND WA
 TO : SUSQUEHANNA NP PA

ST	MILES	>0.0	22.7	59.7	139	326	821	1861	3326	5815		
		0	-22.7	-59.7	-139	-326	-821	-1861	-3326	-5815	>9996	
ID	275.6	66.98	64.43	58.19	32.26	21.75	15.09	8.29	4.14	3.23	1.01	0.31
IL	162.6	19.10	37.80	30.07	23.86	18.01	12.57	9.39	5.42	3.67	2.24	0.40
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89	0.41
IA	305.3	24.97	65.83	90.05	53.91	28.93	20.76	12.84	4.41	2.60	0.81	0.20
NE	452.7	167.05	80.38	106.91	48.99	24.43	9.28	6.16	4.56	2.98	1.48	0.53
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89	0.68
OR	208.5	87.03	39.49	44.10	16.40	8.10	5.98	3.59	2.36	1.22	0.24	0.00
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46	0.12
UT	149.1	51.32	23.29	26.14	15.30	15.41	9.73	4.60	2.35	0.74	0.16	0.05
WA	35.6	24.04	1.96	1.05	0.38	0.47	1.10	1.74	2.05	1.88	0.82	0.19
WY	400.5	207.08	105.56	52.54	12.14	6.48	6.02	4.33	4.26	1.86	0.22	0.06

TOTALS

2628.4 682.33 528.95 549.25 318.26 222.74 148.82 86.08 48.04 29.89 11.22 2.95

PERCENTAGES

25.96 20.12 20.90 12.11 8.47 5.66 3.27 1.83 1.14 0.43 0.11

BASIS: 2000 Census data

RADTRAN Input Data	RURAL	SUBURBAN	URBAN
WEIGHTED POPULATION			
People/sq. mi.	29.6	745.8	5850.2
People/sq. km.	11.4	288.0	2258.8

DISTANCE				TOTALS
Miles	2078.8	505.7	44.1	2628.4
Kilometers	3345.4	813.8	70.9	4229.9
Percentages	79.1	19.2	1.7	

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:

ID 55406 IL 72678 IN 79041 IA 68088 NE 61587 OH 123201 OR 20611 PA 46101
 UT 22778 WA 21232 WY 32573

Total Population within 800 meter Buffer Zone: 603296

RADTRAN BBNPP CASE: UNIRRADATED FUEL

RUN DATE: [10-JUN-08 AT 08:38:04]

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RRRR   AAA   DDDD   TTTTT   RRRR   AAA   N   N   55555   6
R  R  A   A  D   D   T   R  R  A   A  NN  N   5   6
R  R  A   A  D   D   T   R  R  A   A  NN  N   5   6
RRRR   A   A  D   D   T   RRRR   A   A  N  NN  5555   6666
R  R   AAAAA  D   D   T   R  R   AAAAA  N  N   5   6 6
R  R   A   A  D   D   T   R  R   A   A  N  N   5   5   6 6
R  R   A   A  DDDD  T   R  R   A   A  N  N   5555   * 666
    
```

RADTRAN 5.6 February 20, 2006

INPUT ECHO

```

&& R000
TITLE Unirradiated Fuel Truck from Richland to BBNPP
INPUT STANDARD
STD: 0 10 18                && DIMEN=NSEV NRAD NAREAS
STD: 1 3 3 0                && PARM=IRNKC IANA ISEN IPSQSB
STD: .TRUE. .FALSE.        && FORM = UNIT, SI-UNITS?
STD: 2.3E12                 && NEVAL FOR CF252
STD: 9.25E5 5.77E6 1.27E6   && RPCTHY FOR I125, I129, I131
STD: 0.0 0.0 0.0 0.0 0.0   && TRANSFER GAMMA
STD: 7.42E-3 2.02E-2 6.17E-5 3.17E-8 0.0 && TRANSFER NEUTRON
STD: 30 24                  && MITDDIST MITDVEL
STD: 1 2 .0018              && ITRAIN FMINCL DDRWEF
STD: 33 68 105 244 369      && CENTER LINE
STD: 561 1018 1628 2308 4269 && DISTANCES
STD: 5468 11136 13097 21334 40502 && FOR AVERAGE
STD: 69986 89860 120878 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && US CLOUD
STD: 4.59E+02 1.53E+03 3.94E+03 1.25E+04 3.04E+04 6.85E+04 1.76E+05 4.45E+05
STD: 8.59E+05 2.55E+06 4.45E+06 1.03E+07 2.16E+07 5.52E+07 1.77E+08 4.89E+08
STD: 8.12E+08 1.35E+09 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && AREADA
STD: 3.42E-03 1.72E-03 8.58E-04 3.42E-04 1.72E-04 8.58E-05 3.42E-05 1.72E-05
STD: 8.58E-06 3.42E-06 1.72E-06 8.58E-07 3.42E-07 1.72E-07 8.58E-08 5.42E-08
STD: 4.30E-08 3.42E-08 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && DFLEV
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0 && RADIST
STD: 0.5                    && SMLPKG
STD: 1.0 0.87 0.018        && SHIELDING FACTORS RR RS RU
STD: 30 30 800             && OFFLINK {FREEWAY}
STD: 27 30 800             && OFFLINK {NON-FREEWAY}
STD: 5 8 800               && OFFLINK {CITY STREETS}
STD: 30 30 800             && OFFLINK {RAILWAY}
STD: 200 200 1000          && OFFLINK {WATERWAY}
STD: 15 3 3 3 4            && ONLINK {FWAY NONFWY STREET RAIL ADJ}
STD: 6.0 4 40.0           && RPD FNOATT INTERDICT
STD: 0.05 0.2 3.3E-4      && BDF CULVL BRATE
STD: 0.9 0.1              && UBF USWF
STD: 1.0 10.0 1.0         && EVACUATION SURVEY CAMPAIGN
    
```

Unirradiated Fuel Truck from Richland to BBNPP

```

STD: 0.0 0.0 1.5E-8 5.3E-8 && HIGHWAY - RURAL - NONRAD
STD: 0.0 0.0 3.7E-9 1.3E-8 && HIGHWAY - SUBURBAN - NONRAD
STD: 0.0 0.0 2.1E-9 7.5E-9 && HIGHWAY - URBAN - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - R - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - S - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - U - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - R - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - S - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - U - NONRAD
STD: 0.0 0.0 0.0 0.0 0.0 && PSPROB
STD: 0.67 0.67 0.42 && TIMENDE NON-DISPERSAL EVAC TIME (LCF&EARLY)
STD: 2 2 1 && FLAGS=IUOPT IACC REGCHECK
STD: 5E-4, 4E-4, 1.0E-4 && LCFCON(1), LCFCON(2), GECON
STD: R5INGEST.BIN && INGESTION FILE
OUTPUT BQ_SV
FORM UNIT
DIMEN 1 10 18
PARM 1 1 1 0
SEVERITY
  NPOP=1
    NMODE=1
      0.1

  NPOP=2
    NMODE=1
      0.1

  NPOP=3
    NMODE=1
      0.1

RELEASE
GROUP=GROUP_1
  RFRAC
    0.0

  AERSOL
    0.0

  RESP
    0.0

  LOS
    0.0

  DEPVEL 1.0
PACKAGE PACKAGE_1 0.1 1.0 0.0 7.3
  CO60 0.1 GROUP_1
  U235 0.1 GROUP_1

```

Unirradiated Fuel Truck from Richland to BBNPP

```

END
VEHICLE -1 VEHICLE_1 1.00E-01 1.0 0.0 7.3 1.0 2.0 3.1 1.0 1.0
    PACKAGE_1 1.0
FLAGS
    IACC 2
    IUOPT 2
    REGCHECK 1
MODSTD
    DISTOFF FREEWAY 3.00E01 3.00E01 8.00E02
    DISTOFF SECONDARY 2.70E01 3.00E01 8.00E02
    DISTOFF STREET 5.00E00 8.00E00 8.00E02
    DISTON
        FREEWAY 1.50E01
        SECONDARY 3.00E00
        STREET 3.00E00
        ADJACENT 4.00E00
    BDF 5.00E-02
    BRATE 3.30E-04
    CULVL 2.00E-01
    EVACUATION 1.00E00
    GECON 1.00E-04
    INTERDICT 4.00E01
    LCFCON 5.00E-04 4.00E-04
    SURVEY 1.00E01
    UBF 5.20E-01
    USWF 4.80E-01
    CAMPAIGN 8.33E-02
    MITDDIST 3.00E01
    MITDVEL 2.40E01
    RPD 6.00E00
    RR 1.00E00
    RU 1.00E00
    RS 1.00E00
    SMALLPKG 5.00E-01
    RPCTHYROID
        I131 1.27E06
EOF
LINK LINK_1 VEHICLE_1 3345.4 88.49 1.6 11.4 530.0 0.0010 0.0 R 1 1.0
LINK LINK_2 VEHICLE_1 813.8 88.49 1.6 288.0 760.0 0.0010 0.0 S 1 1.0
LINK LINK_3 VEHICLE_1 70.9 88.49 1.6 2258.8 2400.0 0.0010 0.0 U 1 1.0

STOP STOP_1 VEHICLE_1 64300.0 1.0 10.0 1.0 5.9

HANDLING HANDLE_1 VEHICLE_1 1.0 10.0 0.01

EOF

```

Unirradiated Fuel Truck from Richland to BBNPP

NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)

		HIGHWAY	
	ACCIDENT RATE	ACCIDENTS	FATALITIES
LINK_1	1.00E-03	3.35E+00	0.00E+00
LINK_2	1.00E-03	8.14E-01	0.00E+00
LINK_3	1.00E-03	7.09E-02	0.00E+00
TOTALS:	3.00E-03	4.23E+00	0.00E+00

RUN DATE: [10-JUN-08 AT 08:38:04]

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Unirradiated Fuel Truck from Richland to BBNPP

REGULATORY CHECKS

THE SHIPMENT BY VEHICLE_1 IS DESIGNATED AS EXCLUSIVE USE
BUT IS NOT REQUIRED TO BE SO DESIGNATED BY REGULATIONS

Unirradiated Fuel Truck from Richland to BBNPP

INCIDENT-FREE SUMMARY
***** **** *****

IN-TRANSIT POPULATION EXPOSURE IN PERSON-SV

	PASSENGER	CREW	OFF LINK	ON LINK	TOTALS
LINK_1	0.00E+00	1.78E-05	1.36E-07	2.63E-06	2.06E-05
LINK_2	0.00E+00	4.34E-06	8.34E-07	9.16E-07	6.09E-06
LINK_3	0.00E+00	3.78E-07	5.70E-07	2.52E-07	1.20E-06
RURAL	0.00E+00	1.78E-05	1.36E-07	2.63E-06	2.06E-05
SUBURB	0.00E+00	4.34E-06	8.34E-07	9.16E-07	6.09E-06
URBAN	0.00E+00	3.78E-07	5.70E-07	2.52E-07	1.20E-06
TOTALS:	0.00E+00	2.26E-05	1.54E-06	3.80E-06	2.79E-05

MAXIMUM INDIVIDUAL IN-TRANSIT DOSE

VEHICLE_1 5.79E-11 SV

STOP EXPOSURE IN PERSON-SV

ANNULAR AREA	STOP_1	8.31E-05
	TOTAL:	8.31E-05

HANDLING EXPOSURE IN PERSON-SV

HANDLING	VEHICLE	MATERIAL	METHOD	DOSE
HANDLE_1	VEHICLE_1	PACKAGE_1	LINE-SOURCE	3.89E-09
			TOTAL:	3.89E-09

EOI
END OF RUN
SUCCESSFUL COMPLETION

TRAGIS BBNPP CASE: IRRADATED FUEL

TRAGIS Routing Engine Version 1.5.4 -- Highway Data Network 4.0

FROM: SUSQUEHANNA NP PA Leaving : 06/10/08 10:36
 TO : YUCCA MOUNTAIN NV Arriving : 06/12/08 03:07

Routing parameters used to calculate the route-

Routing type: HRCQ Preferred Route with 2 driver(s)
 Preferred roads Time bias: 1.00 Mile bias: 0.00, Toll bias: 1.00
 Nonpreferred roads Time bias: 0.00 Mile bias: 1.00, Toll bias: 1.00, Penalty factor: 30.0

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing
 Prohibit use of roads with Radioactive materials prohibition
 Las Vegas Beltway is considered a preferred route

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		SUSQUEHANNA NP			PA	0.0	0:00	06/10/08	10:36
12.1	U11	LIME RIDGE	NE	I80 X241	PA	12.1	0:14	06/10/08	10:50
235.4	I80	WEST MIDDLESEX	NE	I80 X4	PA	247.5	3:52	06/10/08	14:28
4.0	I80	crossing state border OH/PA			BD	251.5	3:56	06/10/08	14:32
		Rest 30 minutes							
17.9	I80	NORTH JACKSON	NE	I76 I80	OH	269.4	4:46	06/10/08	15:22
76.0	I80 \$	ELYRIA	NW	I80 I90	OH	345.4	6:09	06/10/08	16:45
128.7	I80 \$ I90 \$	WEST JEFFERSON	N	I80 X13	OH	474.1	8:29	06/10/08	19:05
13.1	I80 \$ I90 \$	crossing state border IN/OH			BD	487.2	8:43	06/10/08	19:19
		Rest 30 minutes							
135.4	I80 \$ I90 \$	PORTAGE	W	I80 I90	IN	622.5	11:29	06/10/08	21:05
0.5	I80	LAKE STATION	NE	I80 I94	IN	623.0	11:29	06/10/08	21:05
14.5	I80 I94	HAMMOND	W	I80 X1	IN	637.5	11:45	06/10/08	21:21
0.9	I80 I94	crossing state border IL/IN			BD	638.4	11:46	06/10/08	21:22
3.0	I80 I94	LANSING	W	I294I94	IL	641.4	11:49	06/10/08	21:25
4.9	I294\$ I80 \$	HOMEWOOD	NW	I294I80	IL	646.3	11:54	06/10/08	21:30
		Rest 30 minutes							
154.4	I80	RAPIDS CITY	W	I80 X1	IL	800.7	15:13	06/11/08	00:49
0.3	I80	crossing state border IA/IL			BD	801.0	15:13	06/11/08	00:49
		Rest 30 minutes							
168.0	I80	DES MOINES	N	I235I35	IA	969.0	18:19	06/11/08	03:55
14.2	I35 I80	DES MOINES	W	I235I35	IA	983.2	18:33	06/11/08	04:09
95.7	I80	MINDEN	NW	I680I80	IA	1078.8	20:01	06/11/08	05:37
16.5	I680	LOVELAND	SW	I29 I680	IA	1095.3	20:16	06/11/08	05:52
9.7	I29 I680	CRESCENT	W	I29 I680	IA	1105.0	20:25	06/11/08	06:01
3.0	I680	crossing state border IA/NE			BD	1108.1	20:28	06/11/08	06:04
13.4	I680	OMAHA	SW	I680I80	NE	1121.4	20:43	06/11/08	06:19
		Rest 30 minutes							
		Rest 30 minutes							
422.7	I80	KIMBALL	S	I80 X20	NE	1544.1	27:22	06/11/08	11:58
20.6	I80	crossing state border NE/WY			BD	1564.7	27:39	06/11/08	12:15
		Rest 30 minutes							
382.4	I80	EVANSTON	NE	I80 X18	WY	1947.0	33:15	06/11/08	17:51
18.2	I80	crossing state border UT/WY			BD	1965.2	33:29	06/11/08	18:05
68.4	I80	HOLLADAY	N	I215I80	UT	2033.6	34:24	06/11/08	19:00
10.2	I215	MIDVALE		I15 I215	UT	2043.8	34:33	06/11/08	19:09
		Rest 30 minutes							
294.2	I15	SGU AIRPORT		I15 X6	UT	2338.0	39:02	06/11/08	23:38
6.4	I15	crossing state border AZ/UT			BD	2344.4	39:07	06/11/08	23:43
		Rest 30 minutes							
20.6	I15	LITTLEFIELD		I15 X8	AZ	2365.0	39:54	06/11/08	23:30
8.6	I15	crossing state border AZ/NV			BD	2373.7	40:01	06/11/08	23:37
73.6	I15	N LAS VEGAS	NE	I15 S215	NV	2447.3	41:01	06/12/08	00:37
14.8	C215	LAS VEGAS	NW	U95 C215	NV	2462.0	41:30	06/12/08	01:06
46.1	U95	MERCURY	S	U95 LOCL	NV	2508.1	42:16	06/12/08	01:52
33.1	LOCAL	YUCCA MOUNTAIN			NV	2541.2	43:31	06/12/08	03:07

Total elapsed time: 43:31 Total trip mileage: 2541.2 Impedance: 4915.1

Mileage by State :

AZ: 29.2 IA: 307.1 IL: 162.6 IN: 151.2 NE: 456.6 NV: 167.5
 OH: 235.7 PA: 251.5 UT: 379.2 WY: 400.5

Mileage by Sign Type:

1-INTERSTATE: 2435.1 2-US: 58.2 5-COUNTY: 14.8 6-LOCAL: 33.1

Mileage by Lane Type:

1-Multi-Lane Controlled Access: 2435.1 3-Multi-Lane Divided Highway: 60.9
 5-Principle Road: 12.1 7-Other: 33.1

Mileage by Tribal Lands:

Total Outside Tribal Lands : 2527.2
 Total Inside Tribal Lands : 13.9

Las Vegas Colony : 2.8 Moapa River Reservation : 9.2
 Paiute (UT) Reservation : 1.9

TRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:

FROM: SUSQUEHANNA NP PA
 TO : YUCCA MOUNTAIN NV

ST	MILES	>0.0	22.7	59.7	139	326	821	1861	3326	5815	>9996
AZ	29.2	16.37	10.91	1.52	0.26	0.13	0.07	0.00	0.00	0.00	0.00
IL	162.6	19.10	37.80	30.07	23.86	18.01	12.57	9.39	5.42	3.67	2.24
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89
IA	307.1	26.27	73.66	93.61	51.14	25.99	18.72	10.70	3.86	2.30	0.64
NE	456.6	167.07	80.87	107.72	49.64	24.69	10.77	7.27	4.24	2.75	1.02
NV	167.5	108.64	21.16	17.66	9.52	3.96	3.65	1.23	0.77	0.53	0.40
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46
UT	379.2	118.00	70.04	66.60	38.43	23.87	17.36	14.41	10.53	10.42	8.06
WY	400.5	207.08	105.56	52.54	12.14	6.48	6.02	4.33	4.26	1.86	0.22

TOTALS

2541.2 697.29 510.21 509.92 300.01 202.29 137.45 82.47 47.57 33.24 16.82 3.98
 PERCENTAGES
 27.44 20.08 20.07 11.81 7.96 5.41 3.25 1.87 1.31 0.66 0.16

BASIS: 2000 Census data

RADTRAN Input Data RURAL SUBURBAN URBAN
 WEIGHTED POPULATION
 People/sq. mi. 28.7 765.9 6082.0
 People/sq. km. 11.1 295.7 2348.3

DISTANCE TOTALS
 Miles 2017.4 469.8 54.0 2541.2
 Kilometers 3246.7 756.0 87.0 4089.5
 Percentages 79.4 18.5 2.1

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:

AZ 245 IL 72678 IN 79041 IA 60053 NE 59486 NV 12582 OH 123201 PA 46101
 UT 159594 WY 32573

Total Population within 800 meter Buffer Zone: 645554

RADTRAN BBNPP CASE: IRRADATED FUEL

RUN DATE: [11-JUN-08 AT 09:52:44]

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```

RRRR   AAA   DDDD   TTTT   RRRR   AAA   N   N   55555   6
R  R  A  A  D  D   T   R  R  A  A  NN  N   5   6
R  R  A  A  D  D   T   R  R  A  A  NN  N   5   6
RRRR   A  A  D  D   T   RRRR  A  A  N  NN  5555   6666
R  R   AAAAA  D  D   T   R  R   AAAAA  N  N   5   6 6
R  R  A  A  D  D   T   R  R  A  A  N  N   5  5   6  6
R  R  A  A  DDDD   T   R  R  A  A  N  N   5555   *  666
    
```

RADTRAN 5.6 February 20, 2006

INPUT ECHO

```

&& R000
TITLE Irradiated Fuel Truck from BBNPP to Yucca Mt.
INPUT STANDARD
STD: 0 10 18 && DIMEN=NSEV NRAD NAREAS
STD: 1 3 3 0 && PARM=IRNKC IANA ISEN IPSQSB
STD: .TRUE. .FALSE. && FORM = UNIT, SI-UNITS?
STD: 2.3E12 && NEVAL FOR CF252
STD: 9.25E5 5.77E6 1.27E6 && RPCTHY FOR I125, I129, I131
STD: 0.0 0.0 0.0 0.0 0.0 && TRANSFER GAMMA
STD: 7.42E-3 2.02E-2 6.17E-5 3.17E-8 0.0 && TRANSFER NEUTRON
STD: 30 24 && MITDDIST MITDVEL
STD: 1 2 .0018 && ITRAIN FMINCL DDRWEF
STD: 33 68 105 244 369 && CENTER LINE
STD: 561 1018 1628 2308 4269 && DISTANCES
STD: 5468 11136 13097 21334 40502 && FOR AVERAGE
STD: 69986 89860 120878 0 0 0 0 0 0 0 0 0 0 0 0 && US CLOUD
STD: 4.59E+02 1.53E+03 3.94E+03 1.25E+04 3.04E+04 6.85E+04 1.76E+05 4.45E+05
STD: 8.59E+05 2.55E+06 4.45E+06 1.03E+07 2.16E+07 5.52E+07 1.77E+08 4.89E+08
STD: 8.12E+08 1.35E+09 0 0 0 0 0 0 0 0 0 0 0 0 && AREADA
STD: 3.42E-03 1.72E-03 8.58E-04 3.42E-04 1.72E-04 8.58E-05 3.42E-05 1.72E-05
STD: 8.58E-06 3.42E-06 1.72E-06 8.58E-07 3.42E-07 1.72E-07 8.58E-08 5.42E-08
STD: 4.30E-08 3.42E-08 0 0 0 0 0 0 0 0 0 0 0 0 && DFLEV
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 && RADIST
STD: 0.5 && SMLPKG
STD: 1.0 0.87 0.018 && SHIELDING FACTORS RR RS RU
STD: 30 30 800 && OFFLINK {FREEWAY}
STD: 27 30 800 && OFFLINK {NON-FREEWAY}
STD: 5 8 800 && OFFLINK {CITY STREETS}
STD: 30 30 800 && OFFLINK {RAILWAY}
STD: 200 200 1000 && OFFLINK {WATERWAY}
STD: 15 3 3 3 4 && ONLINK {FWAY NONFWY STREET RAIL ADJ}
STD: 6.0 4 40.0 && RPD FNOATT INTERDICT
STD: 0.05 0.2 3.3E-4 && BDF CULVL BRATE
STD: 0.9 0.1 && UBF USWF
STD: 1.0 10.0 1.0 && EVACUATION SURVEY CAMPAIGN
    
```

RUN DATE: [11-JUN-08 AT 09:52:44]

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Irradiated Fuel Truck from BBNPP to Yucca Mt.

```

STD: 0.0 0.0 1.5E-8 5.3E-8 && HIGHWAY - RURAL - NONRAD
STD: 0.0 0.0 3.7E-9 1.3E-8 && HIGHWAY - SUBURBAN - NONRAD
STD: 0.0 0.0 2.1E-9 7.5E-9 && HIGHWAY - URBAN - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - R - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - S - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - U - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - R - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - S - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - U - NONRAD
STD: 0.0 0.0 0.0 0.0 0.0 0.0 && PSPROB
STD: 0.67 0.67 0.42 && TIMENDE NON-DISPERSAL EVAC TIME (LCF&EARLY)
STD: 2 2 1 && FLAGS=IUOPT IACC REGCHECK
STD: 5E-4, 4E-4, 1.0E-4 && LCFCON(1), LCFCON(2), GECON
STD: R5INGEST.BIN && INGESTION FILE
OUTPUT BQ_SV
    
```

```

FORM UNIT
DIMEN 19 10 18
PARM 1 1 1 0
SEVERITY
  NPOP=1
    NMODE=1
      1.53E-8
      5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
      0.0 1.13E-8 8.03E-11 0.0 1.44E-10
      1.02E-12 0.0 7.49E-11 0.0 0.0
      0.0 5.86E-6 0.99993
    NPOP=2
      NMODE=1
        1.53E-8
        5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
        0.0 1.13E-8 8.03E-11 0.0 1.44E-10
        1.02E-12 0.0 7.49E-11 0.0 0.0
        0.0 5.86E-6 0.99993
      NPOP=3
        NMODE=1
          1.53E-8
          5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
          0.0 1.13E-8 8.03E-11 0.0 1.44E-10
          1.02E-12 0.0 7.49E-11 0.0 0.0
          0.0 5.86E-6 0.99993
RELEASE
  GROUP=Part
    RFRAC
      6.0E-7
      1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
      2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
      6.7E-7 6.8E-7 1.8E-5 9.0E-6 6.8E-7
      6.8E-7 6.7E-8 0.0
    AERSOL

```

```
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Cs
RFRAC
2.4E-8
4.1E-9 5.4E-9 3.6E-5 1.3E-8 1.5E-8
2.7E-5 2.4E-8 2.7E-8 5.9E-6 2.4E-8
2.7E-8 5.9E-6 9.6E-5 5.5E-5 5.9E-6
5.9E-6 1.7E-5 0.0
AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Ru
RFRAC
6.0E-7
1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
6.7E-7 6.8E-7 8.4E-5 5.0E-5 6.4E-6
6.4E-6 6.7E-8 0.0
AERSOL
1.0
```

```
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
```

0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Gas
RFRAC
0.8
0.14 0.18 0.84 0.43 0.49
0.85 0.82 0.89 0.91 0.82
0.89 0.91 0.84 0.85 0.91
0.91 0.84 0.0

AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0

DEPVEL 0.0
GROUP=Cor
RFRAC
0.0020
0.0014 0.0018 0.0032 0.0018 0.0021
0.0031 0.02 0.0022 0.0025 0.0020
0.0022 0.0025 0.0064 0.0059 0.0033
0.0033 0.0025 0.0

AERSOL
1.0
1.0 1.0 1.0 1.0 1.0

RUN DATE: [11-JUN-08 AT 09:52:44]
Irradiated Fuel Truck from BBNPP to Yucca Mt.

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1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0

DEPVEL 0.01
PACKAGE PACKAGE_1 14.0 1.0 0.0 5.2
AM242M 23.9 Part
AM243 32.2 Part
CE144 15200.0 Part
CM242 43.6 Part
CM243 32.0 Part
CM244 4830.0 Part
CM245 0.618 Part
EU154 11700.0 Part
EU155 5730.0 Part
PM147 35500.0 Part
PU238 6940.0 Part
PU239 423.0 Part

PU240 724.0 Part
 PU241 117000.0 Part
 PU242 2.28 Part
 SR90 103000.0 Part
 Y90 103000.0 Part
 SB125 5350.0 Part
 AM241 1250.0 Part
 CS134 58400.0 Cs
 CS137 142000.0 Cs
 I129 0.0465 Cs
 RU106 20500.0 Ru
 KR85 10500.0 Gas
 CO60 76.0 Cor

END
 VEHICLE -1 VEHICLE_1 1.40E01 1.0 0.0 5.2 1.0 2.0 5.45 1.0 1.0
 PACKAGE_1 1.0

FLAGS
 IACC 2
 IUOPT 2
 REGCHECK 1

MODSTD
 DISTOFF FREEWAY 3.00E01 3.00E01 8.00E02
 DISTOFF SECONDARY 2.70E01 3.00E01 8.00E02
 DISTOFF STREET 5.00E00 8.00E00 8.00E02

RUN DATE: [11-JUN-08 AT 09:52:44] PAGE 6

Irradiated Fuel Truck from BBNPP to Yucca Mt.

DISTON
 FREEWAY 1.50E01
 SECONDARY 3.00E00
 STREET 3.00E00
 ADJACENT 4.00E00
 BDF 5.00E-02
 BRATE 3.30E-04
 CULVL 2.00E-01
 EVACUATION 6.70E-01
 GECON 1.00E-04
 INTERDICT 8.00E00
 LCFCON 5.00E-04 4.00E-04
 SURVEY 1.00E01
 UBF 1.00E-01
 USWF 9.00E-01
 CAMPAIGN 2.01E03
 MITDDIST 3.00E01
 MITDVEL 2.40E01
 RPD 6.00E00
 RR 1.00E00
 RU 1.80E-02
 RS 8.70E-01
 SMALLPKG 5.00E-01
 RPCTHYROID
 I129 1.27E06

EOF
 LINK LINK_1 VEHICLE_1 3246.7 88.49 1.5 11.1 530.0 3.3E-7 0.031 R 1 1.0
 LINK LINK_2 VEHICLE_1 756.0 88.49 1.5 295.7 760.0 3.3E-7 0.031 S 1 1.0
 LINK LINK_3 VEHICLE_1 87.0 88.49 1.5 2348.3 2400.0 3.3E-7 0.031 U 1 1.0

STOP STOP_1 VEHICLE_1 30000.0 1.0 10.0 1.0 4.5
 STOP STOP_2 VEHICLE_1 340.0 10.0 800.0 0.2 4.5

HANDLING HANDLE_1 VEHICLE_1 5.0 1.0 0.5

EOF

Irradiated Fuel Truck from BBNPP to Yucca Mt.

NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)

	HIGHWAY		
	ACCIDENT RATE	ACCIDENTS	FATALITIES
LINK_1	3.30E-07	1.07E-03	3.32E-05
LINK_2	3.30E-07	2.49E-04	7.73E-06
LINK_3	3.30E-07	2.87E-05	8.90E-07
TOTALS:	9.90E-07	1.35E-03	4.18E-05

RUN DATE: [11-JUN-08 AT 09:52:44]

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Irradiated Fuel Truck from BBNPP to Yucca Mt.

REGULATORY CHECKS

FOR VEHICLE_1 THE DOSE RATE AT 2 METERS COULD EXCEED 0.1 MSV/HR
THE VEHICLE DOSE RATE HAS BEEN RESET TO EQUAL 0.13 MSV/HR

Irradiated Fuel Truck from BBNPP to Yucca Mt.

INCIDENT-FREE SUMMARY
***** **** *****

IN-TRANSIT POPULATION EXPOSURE IN PERSON-SV
*INPUT DATA WERE ALTERED WITH REGULATORY CHECKS

	PASSENGER	CREW	OFF LINK	ON LINK	TOTALS
LINK_1	0.00E+00	7.84E-04	1.23E-05	2.29E-04	1.03E-03
LINK_2	0.00E+00	1.83E-04	6.62E-05	7.63E-05	3.25E-04
LINK_3	0.00E+00	2.10E-05	1.25E-06	2.77E-05	5.00E-05
RURAL	0.00E+00	7.84E-04	1.23E-05	2.29E-04	1.03E-03
SUBURB	0.00E+00	1.83E-04	6.62E-05	7.63E-05	3.25E-04
URBAN	0.00E+00	2.10E-05	1.25E-06	2.77E-05	5.00E-05
TOTALS:	0.00E+00	9.88E-04	7.97E-05	3.33E-04	1.40E-03

MAXIMUM INDIVIDUAL IN-TRANSIT DOSE

VEHICLE_1 5.96E-09 SV

STOP EXPOSURE IN PERSON-SV

ANNULAR AREA	STOP_1	2.83E-03
ANNULAR AREA	STOP_2	1.22E-05
TOTAL:		2.84E-03

HANDLING EXPOSURE IN PERSON-SV

HANDLING	VEHICLE	MATERIAL	METHOD	DOSE
HANDLE_1	VEHICLE_1	PACKAGE_1	LINE-SOURCE	1.17E-03
TOTAL:				1.17E-03

EOI
END OF RUN
SUCCESSFUL COMPLETION

TRAGIS BBNPP CASE: RADIOACTIVE WASTE

TRAGIS Routing Engine Version 1.5.4 -- Highway Data Network 4.0

FROM: SUSQUEHANNA NP PA Leaving : 06/11/08 10:39
 TO : HANFORD RPSTRY WA Arriving : 06/13/08 05:45

Routing parameters used to calculate the route-

Routing type: Commercial with 2 driver(s)
 Time bias: 0.70 Mile bias: 0.30, Toll bias: 1.00

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		SUSQUEHANNA NP			PA	0.0	0:00	06/11/08	10:39
12.1	U11	LIME RIDGE	NE	I80 X241	PA	12.1	0:14	06/11/08	10:53
235.4	I80	WEST MIDDLESEX	NE	I80 X4	PA	247.5	3:52	06/11/08	14:31
4.0	I80	crossing state border		OH/PA	BD	251.5	3:56	06/11/08	14:35
		Rest 30 minutes							
17.9	I80	NORTH JACKSON	NE	I76 I80	OH	269.4	4:46	06/11/08	15:25
76.0	I80 \$	ELYRIA	NW	I80 I90	OH	345.4	6:09	06/11/08	16:48
128.7	I80 \$ I90 \$	WEST JEFFERSON	N	I80 X13	OH	474.1	8:29	06/11/08	19:08
13.1	I80 \$ I90 \$	crossing state border		IN/OH	BD	487.2	8:43	06/11/08	19:22
		Rest 30 minutes							
135.4	I80 \$ I90 \$	PORTAGE	W	I80 I90	IN	622.5	11:29	06/11/08	21:08
0.5	I80	LAKE STATION	NE	I80 I94	IN	623.0	11:29	06/11/08	21:08
14.5	I80 I94	HAMMOND	W	I80 X1	IN	637.5	11:45	06/11/08	21:24
0.9	I80 I94	crossing state border		IL/IN	BD	638.4	11:46	06/11/08	21:25
3.0	I80 I94	LANSING	W	I294I94	IL	641.4	11:49	06/11/08	21:28
4.9	I294\$ I80 \$	HOMEWOOD	NW	I294I80	IL	646.3	11:54	06/11/08	21:33
26.9	I294\$	HILLSIDE	NW	I290I294	IL	673.2	12:24	06/11/08	22:03
15.6	I290	ROLLING MDWS	S	I290I90	IL	688.8	12:41	06/11/08	22:20
		Rest 30 minutes							
50.6	I90 \$	CHERRY VALLEY	NE	I39 I90	IL	739.4	14:06	06/11/08	23:45
17.2	I39 \$ I90 \$	SOUTH BELOIT	E	I90 S75	IL	756.6	14:25	06/12/08	00:04
0.3	I39 I90	crossing state border		IL/WI	BD	756.9	14:25	06/12/08	00:04
79.3	I39 I90	PORTAGE	S	I39 I90	WI	836.2	15:40	06/12/08	01:19
63.0	I90 I94	TOMAH	E	I90 I94	WI	899.1	16:38	06/12/08	02:17
43.1	I90	LSE AIRPORT		I90 X2	WI	942.3	17:18	06/12/08	02:57
2.2	I90	crossing state border		MN/WI	BD	944.5	17:20	06/12/08	02:59
		Rest 30 minutes							
273.8	I90	BEAVER CREEK	W	I90 X1	MN	1218.3	21:44	06/12/08	07:23
1.0	I90	crossing state border		MN/SD	BD	1219.4	21:45	06/12/08	07:24
		Rest 30 minutes							
		Rest 30 minutes							
401.4	I90	SPEARFISH	N	I90 X10	SD	1620.8	28:07	06/12/08	12:46
10.1	I90	crossing state border		SD/WY	BD	1631.0	28:15	06/12/08	12:54
		Rest 30 minutes							
		Rest 30 minutes							
534.1	I90	BUTTE	E	I15 I90	MT	2165.1	37:04	06/12/08	21:43
8.5	I15 I90	BUTTE	W	I15 I90	MT	2173.5	37:13	06/12/08	21:52
		Rest 30 minutes							
121.9	I90	FRENCHTOWN	E	I90 X96	MT	2295.4	39:38	06/13/08	00:17
96.9	I90	crossing state border		ID/MT	BD	2392.3	41:14	06/13/08	01:53
60.9	I90	COEUR D'ALENE	N	I90 X12	ID	2453.2	42:11	06/13/08	01:50
11.5	I90	crossing state border		ID/WA	BD	2464.7	42:21	06/13/08	02:00
		Rest 30 minutes							
79.4	I90	RITZVILLE	SW	I90 X220	WA	2544.2	44:11	06/13/08	03:50
29.8	U395	HATTON	E	U395S26	WA	2573.9	44:46	06/13/08	04:25
20.6	S26	OTHELLO	S	S24 S26	WA	2594.5	45:11	06/13/08	04:50
40.8	S24	VERNITA	SE	S24 S240	WA	2635.3	46:00	06/13/08	05:39
4.4	S240	HANFORD RPSTRY			WA	2639.7	46:06	06/13/08	05:45

Total elapsed time: 46:06 Total trip mileage: 2639.7 Impedance: 2518.4

Mileage by State :
 ID: 72.4 IL: 118.5 IN: 151.2 MN: 274.9 MT: 552.1 OH: 235.7
 PA: 251.5 SD: 411.6 WA: 174.9 WI: 187.6 WY: 209.2

Mileage by Sign Type:
 1-INTERSTATE: 2532.0 2-US: 41.9 3-STATE: 65.8

Mileage by Lane Type:
 1-Multi-Lane Controlled Access: 2532.0 5-Principle Road: 51.6
 6-Through Road: 56.0

Mileage by Tribal Lands:
 Total Outside Tribal Lands : 2581.8
 Total Inside Tribal Lands : 57.8

Crow Reservation : 55.6 Ho-Chunk Reservation : 2.2

FRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:
 FROM: SUSQUEHANNA NP PA
 TO : HANFORD RPSTRY WA

ST	MILES	>0.0	22.7	59.7	139	326	821	1861	3326	5815		
		0	-22.7	-59.7	-139	-326	-821	-1861	-3326	-5815	-9996	>9996
ID	72.4	21.42	11.27	8.15	5.64	7.23	6.20	6.34	3.23	2.30	0.54	0.12
IL	118.5	2.78	9.52	17.48	17.44	14.08	12.84	13.47	13.43	8.94	6.78	1.80
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89	0.41
MN	274.9	48.86	54.79	98.57	41.37	15.77	10.45	3.50	0.89	0.42	0.27	0.00
MT	552.1	219.62	110.24	107.63	45.30	27.09	18.12	12.62	6.17	3.55	1.68	0.11
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89	0.68
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46	0.12
SD	411.6	162.73	102.51	79.06	30.19	17.88	10.02	5.14	2.55	0.95	0.50	0.12
WA	174.9	83.95	28.68	25.70	8.25	5.78	6.69	5.93	4.51	3.96	1.21	0.26
WI	187.6	13.63	36.05	43.56	43.83	23.75	13.41	6.51	3.45	2.56	0.68	0.17
WY	209.2	94.31	64.55	33.62	6.66	2.58	1.92	2.19	2.04	1.27	0.05	0.05

TOTALS
 2639.7 682.06 527.82 553.97 313.70 213.32 147.94 90.84 54.76 35.66 15.95 3.84
 PERCENTAGES
 25.84 19.99 20.98 11.88 8.08 5.60 3.44 2.07 1.35 0.60 0.15

BASIS: 2000 Census data

RADTRAN Input Data	RURAL	SUBURBAN	URBAN
WEIGHTED POPULATION			
People/sq. mi.	29.5	785.8	5975.1
People/sq. km.	11.4	303.4	2307.0

DISTANCE				TOTALS
Miles	2077.5	506.9	55.5	2639.7
Kilometers	3343.4	815.7	89.2	4248.0
Percentages	78.7	19.2	2.1	

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:
 ID 32240 IL 153793 IN 79041 MN 24787 MT 70057 OH 123201 PA 46101 SD 34521
 WA 51727 WI 43952 WY 15735

Total Population within 800 meter Buffer Zone: 675155

RADTRAN BBNPP CASE: RADIOACTIVE WASTE

RUN DATE: [16-JUN-08 AT 16:15:19]

PAGE 1

```

RRRR   AAA   DDDD   TTTTT   RRRR   AAA   N   N   55555   6
R  R  A   A  D   D   T   R  R  A   A   NN  N   5   6
R  R  A   A  D   D   T   R  R  A   A   NN  N   5   6
RRRR   A   A  D   D   T   RRRR   A   A   N   NN  5555   6666
R  R   AAAAA  D   D   T   R  R   AAAAA  N   N   5   6   6
R  R   A   A  D   D   T   R  R   A   A   N   N   5   5   6   6
R  R   A   A  DDDD  T   R  R   A   A   N   N   5555   *   666
    
```

RADTRAN 5.6 February 20, 2006

INPUT ECHO

```

&& R000
TITLE Radwaste Annual Activity from BBNPP to Hanford, WA
INPUT STANDARD
STD: 0 10 18                && DIMEN=NSEV NRAD NAREAS
STD: 1 3 3 0                && PARM=IRNKC IANA ISEN IPSQSB
STD: .TRUE. .FALSE.        && FORM = UNIT, SI-UNITS?
STD: 2.3E12                 && NEVAL FOR CF252
STD: 9.25E5 5.77E6 1.27E6   && RPCTHY FOR I125, I129, I131
STD: 0.0 0.0 0.0 0.0 0.0   && TRANSFER GAMMA
STD: 7.42E-3 2.02E-2 6.17E-5 3.17E-8 0.0 && TRANSFER NEUTRON
STD: 30 24                  && MITDDIST MITDVEL
STD: 1 2 .0018              && ITRAIN FMINCL DDRWEF
STD: 33 68 105 244 369     && CENTER LINE
STD: 561 1018 1628 2308 4269 && DISTANCES
STD: 5468 11136 13097 21334 40502 && FOR AVERAGE
STD: 69986 89860 120878 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && US CLOUD
STD: 4.59E+02 1.53E+03 3.94E+03 1.25E+04 3.04E+04 6.85E+04 1.76E+05 4.45E+05
STD: 8.59E+05 2.55E+06 4.45E+06 1.03E+07 2.16E+07 5.52E+07 1.77E+08 4.89E+08
STD: 8.12E+08 1.35E+09 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && AREADA
STD: 3.42E-03 1.72E-03 8.58E-04 3.42E-04 1.72E-04 8.58E-05 3.42E-05 1.72E-05
STD: 8.58E-06 3.42E-06 1.72E-06 8.58E-07 3.42E-07 1.72E-07 8.58E-08 5.42E-08
STD: 4.30E-08 3.42E-08 0 0 0 0 0 0 0 0 0 0 0 0 0 0 && DFLEV
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0 0 && RADIST
STD: 0.5                    && SMLPKG
STD: 1.0 0.87 0.018        && SHIELDING FACTORS RR RS RU
STD: 30 30 800             && OFFLINK {FREEWAY}
STD: 27 30 800             && OFFLINK {NON-FREEWAY}
STD: 5 8 800               && OFFLINK {CITY STREETS}
STD: 30 30 800             && OFFLINK {RAILWAY}
STD: 200 200 1000         && OFFLINK {WATERWAY}
STD: 15 3 3 3 4           && ONLINK {FWAY NONFWY STREET RAIL ADJ}
STD: 6.0 4 40.0           && RPD FNOATT INTERDICT
STD: 0.05 0.2 3.3E-4     && BDF CULVL BRATE
STD: 0.9 0.1              && UBF USWF
STD: 1.0 10.0 1.0        && EVACUATION SURVEY CAMPAIGN
    
```

Radwaste Annual Activity from BBNPP to Hanford, WA

```

STD: 0.0 0.0 1.5E-8 5.3E-8 && HIGHWAY - RURAL - NONRAD
STD: 0.0 0.0 3.7E-9 1.3E-8 && HIGHWAY - SUBURBAN - NONRAD
STD: 0.0 0.0 2.1E-9 7.5E-9 && HIGHWAY - URBAN - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - R - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - S - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - U - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - R - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - S - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - U - NONRAD
STD: 0.0 0.0 0.0 0.0 0.0 0.0 && PSPROB
STD: 0.67 0.67 0.42 && TIMENDE NON-DISPERSAL EVAC TIME (LCF&EARLY)
STD: 2 2 1 && FLAGS=IUOPT IACC REGCHECK
STD: 5E-4, 4E-4, 1.0E-4 && LCFCON(1), LCFCON(2), GECON
STD: R5INGEST.BIN && INGESTION FILE
OUTPUT BQ_SV
FORM UNIT
DIMEN 19 10 18
PARM 1 1 1 0
SEVERITY
  NPOP=1
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
  NPOP=2
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
  NPOP=3
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
RELEASE
  GROUP=Part
    RFRAC
      6.0E-7
    1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
    2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
    6.7E-7 6.8E-7 1.8E-5 9.0E-6 6.8E-7
    6.8E-7 6.7E-8 0.0
    AERSOL

```

```
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Cs
RFRAC
2.4E-8
4.1E-9 5.4E-9 3.6E-5 1.3E-8 1.5E-8
2.7E-5 2.4E-8 2.7E-8 5.9E-6 2.4E-8
2.7E-8 5.9E-6 9.6E-5 5.5E-5 5.9E-6
5.9E-6 1.7E-5 0.0
AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Ru
RFRAC
6.0E-7
1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
6.7E-7 6.8E-7 8.4E-5 5.0E-5 6.4E-6
6.4E-6 6.7E-8 0.0
AERSOL
1.0
```

```
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
```

```

0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
  DEPVEL 0.01
  GROUP=Cor
  RFRAC
    0.0020
0.0014 0.0018 0.0032 0.0018 0.0021
0.0031 0.02 0.0022 0.0025 0.0020
0.0022 0.0025 0.0064 0.0059 0.0033
0.0033 0.0025 0.0
  AERSOL
    1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
  RESP
    1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
  LOS
    0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
  DEPVEL 0.01
PACKAGE PACKAGE_1 14.0 1.0 0.0 5.2
  CE144 0.775 Part
  PU241 0.339 Part
  SB124 0.0114 Part
  SB125 0.0374 Part
  SR89 0.0133 Part
  SR90 2.64 Part
  Y90 2.55 Part
  CS134 184.0 Cs
  CS137 349.0 Cs

```

RUN DATE: [16-JUN-08 AT 16:15:19]

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Radwaste Annual Activity from BBNPP to Hanford, WA

```

I129 9.06E-4 Cs
I131 0.00916 Cs
RU106 20.8 Ru
RU103 12.5 Ru
CO60 237.0 Cor
CO58 114.0 Cor
FE55 473.0 Cor
MN54 360.0 Cor
ZN65 93.4 Cor
END
VEHICLE -1 VEHICLE_1 1.40E01 1.0 0.0 5.2 1.0 2.0 5.45 1.0 1.0
  PACKAGE_1 1.0
FLAGS
  IACC 2
  IUOPT 2
  REGCHECK 1
MODSTD
  DISTOFF FREEWAY 3.00E01 3.00E01 8.00E02
  DISTOFF SECONDARY 2.70E01 3.00E01 8.00E02
  DISTOFF STREET 5.00E00 8.00E00 8.00E02
  DISTON
    FREEWAY 1.50E01
    SECONDARY 3.00E00
    STREET 3.00E00
    ADJACENT 4.00E00
  BDF 5.00E-02
  BRATE 3.30E-04

```

CULVL 2.00E-01
EVACUATION 6.70E-01
GECON 1.00E-04
INTERDICT 8.00E00
LCFCON 5.00E-04 4.00E-04
SURVEY 1.00E01
UBF 1.00E-01
USWF 9.00E-01
CAMPAIGN 2.01E03
MITDDIST 3.00E01
MITDVEL 2.40E01
RPD 6.00E00
RR 1.00E00
RU 1.80E-02
RS 8.70E-01
SMALLPKG 5.00E-01
RPCTHYROID
I129 1.27E06
EOF
LINK LINK_1 VEHICLE_1 3343.4 88.49 1.5 11.4 530.0 3.81E-7 0.0216 R 1 1.0
LINK LINK_2 VEHICLE_1 815.7 88.49 1.5 303.4 760.0 3.81E-7 0.0216 S 1 1.0
LINK LINK_3 VEHICLE_1 89.2 88.49 1.5 2307.0 2400.0 3.81E-7 0.0216 U 1 1.0

STOP STOP_1 VEHICLE_1 30000.0 1.0 10.0 1.0 5.0
STOP STOP_2 VEHICLE_1 340.0 10.0 800.0 0.2 5.0

HANDLING HANDLE_1 VEHICLE_1 5.0 1.0 0.5

EOF

Radwaste Annual Activity from BBNPP to Hanford, WA

NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)

		HIGHWAY	
	ACCIDENT RATE	ACCIDENTS	FATALITIES
LINK_1	3.81E-07	1.27E-03	2.75E-05
LINK_2	3.81E-07	3.11E-04	6.71E-06
LINK_3	3.81E-07	3.40E-05	7.34E-07
TOTALS:	1.14E-06	1.62E-03	3.50E-05

RUN DATE: [16-JUN-08 AT 16:15:19]

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Radwaste Annual Activity from BBNPP to Hanford, WA

REGULATORY CHECKS

FOR VEHICLE_1 THE DOSE RATE AT 2 METERS COULD EXCEED 0.1 MSV/HR
THE VEHICLE DOSE RATE HAS BEEN RESET TO EQUAL 0.13 MSV/HR

Radwaste Annual Activity from BBNPP to Hanford, WA

INCIDENT-FREE SUMMARY
***** **** *****

IN-TRANSIT POPULATION EXPOSURE IN PERSON-SV
*INPUT DATA WERE ALTERED WITH REGULATORY CHECKS

	PASSENGER	CREW	OFF LINK	ON LINK	TOTALS
LINK_1	0.00E+00	8.08E-04	1.30E-05	2.35E-04	1.06E-03
LINK_2	0.00E+00	1.97E-04	7.33E-05	8.24E-05	3.53E-04
LINK_3	0.00E+00	2.16E-05	1.26E-06	2.84E-05	5.13E-05
RURAL	0.00E+00	8.08E-04	1.30E-05	2.35E-04	1.06E-03
SUBURB	0.00E+00	1.97E-04	7.33E-05	8.24E-05	3.53E-04
URBAN	0.00E+00	2.16E-05	1.26E-06	2.84E-05	5.13E-05
TOTALS:	0.00E+00	1.03E-03	8.75E-05	3.46E-04	1.46E-03

MAXIMUM INDIVIDUAL IN-TRANSIT DOSE

VEHICLE_1 5.96E-09 SV

STOP EXPOSURE IN PERSON-SV

ANNULAR AREA	STOP_1	3.14E-03
ANNULAR AREA	STOP_2	1.36E-05
TOTAL:		3.16E-03

HANDLING EXPOSURE IN PERSON-SV

HANDLING	VEHICLE	MATERIAL	METHOD	DOSE
HANDLE_1	VEHICLE_1	PACKAGE_1	LINE-SOURCE	1.17E-03
TOTAL:				1.17E-03

EOI
END OF RUN
SUCCESSFUL COMPLETION

SUPPORTING TRAGIS & RADTRAN CASE SUMMARIES FOR ER SECTION 7.4 FOR BBNPP:

TRAGIS BBNPP CASE: UNIRRADATED FUEL

TRAGIS Routing Engine Version 1.5.4 -- Highway Data Network 4.0

FROM: RICHLAND WA Leaving : 06/09/08 13:26
 TO : SUSQUEHANNA NP PA Arriving : 06/11/08 14:07

Routing parameters used to calculate the route-

Routing type: Commercial with 2 driver(s)
 Time bias: 0.70 Mile bias: 0.30, Toll bias: 1.00

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		RICHLAND			WA	0.0	0:00	06/09/08	13:26
10.1	S240	KENNEWICK	NW	U395S240	WA	10.1	0:13	06/09/08	13:39
5.8	U395	KENNEWICK	SW	I82 X113	WA	15.9	0:21	06/09/08	13:47
19.1	I82	PLYMOUTH		I82 X131	WA	35.0	0:40	06/09/08	14:06
0.7	I82	crossing state border		OR/WA	BD	35.6	0:41	06/09/08	14:07
10.6	I82	HERMISTON	SW	I82 I84	OR	46.2	0:52	06/09/08	14:18
		Rest 30 minutes							
196.6	I84	ONTARIO	E	I84 X376	OR	242.8	4:57	06/09/08	19:23
1.3	I84	crossing state border		ID/OR	BD	244.1	4:58	06/09/08	19:24
		Rest 30 minutes							
221.6	I84	RAFT RIVER	W	I84 I86	ID	465.7	8:53	06/09/08	23:19
54.0	I84	crossing state border		ID/UT	BD	519.7	9:43	06/10/08	00:09
41.8	I84	TREMONTON	W	I15 I84	UT	561.5	10:18	06/10/08	00:44
39.4	I15	OGDEN	S	I15 I84	UT	600.9	10:52	06/10/08	01:18
38.5	I84	ECHO		I80 I84	UT	639.5	11:23	06/10/08	01:49
29.4	I80	crossing state border		UT/WY	BD	668.9	11:47	06/10/08	02:13
		Rest 30 minutes							
		Rest 30 minutes							
360.1	I80	CHEYENNE	S	I80 X362	WY	1028.9	17:35	06/10/08	08:01
40.5	I80	crossing state border		NE/WY	BD	1069.4	18:07	06/10/08	08:33
		Rest 30 minutes							
450.5	I80	OMAHA	S	I80 X453	NE	1520.0	24:41	06/10/08	16:07
2.2	I80	crossing state border		IA/NE	BD	1522.1	24:43	06/10/08	16:09
0.9	I80	COUNCIL BLUFFS	SW	I29 I80	IA	1523.0	24:44	06/10/08	16:10
2.8	I29	COUNCIL BLUFFS	SE	I29 I80	IA	1525.8	24:47	06/10/08	16:13
		Rest 30 minutes							
119.5	I80	DES MOINES	W	I235I35	IA	1645.3	27:08	06/10/08	18:34
14.2	I35	DES MOINES	N	I235I35	IA	1659.5	27:22	06/10/08	18:48
		Rest 30 minutes							
167.6	I80	LE CLAIRE	SW	I80 X306	IA	1827.1	30:27	06/10/08	21:53
0.4	I80	crossing state border		IA/IL	BD	1827.4	30:28	06/10/08	21:54
154.7	I80	HOMWOOD	NW	I294I80	IL	1982.1	33:16	06/11/08	00:42
4.9	I294	LANSING	W	I294I94	IL	1987.1	33:22	06/11/08	00:48
3.0	I80	crossing state border		IL/IN	BD	1990.0	33:25	06/11/08	00:51
		Rest 30 minutes							
15.4	I80	LAKE STATION	NE	I80 I94	IN	2005.4	34:11	06/11/08	01:37
0.5	I80	PORTAGE	W	I80 I90	IN	2005.9	34:12	06/11/08	01:38
122.2	I80	JAMESTOWN	SE	I69 I80	IN	2128.1	36:14	06/11/08	03:40
13.2	I80	crossing state border		IN/OH	BD	2141.3	36:27	06/11/08	03:53
		Rest 30 minutes							
141.8	I80	ELYRIA	NW	I80 I90	OH	2283.0	39:32	06/11/08	07:58
76.0	I80	NORTH JACKSON	NE	I76 I80	OH	2359.0	40:55	06/11/08	09:21
15.2	I80	HUBBARD	N	I80 X234	OH	2374.2	41:12	06/11/08	09:38
2.7	I80	crossing state border		OH/PA	BD	2376.9	41:14	06/11/08	09:40
		Rest 30 minutes							
239.4	I80	LIME RIDGE	NE	I80 X241	PA	2616.3	45:27	06/11/08	13:53

12.1 U11 SUSQUEHANNA NP PA 2628.4 45:41 06/11/08 14:07

Total elapsed time: 45:41 Total trip mileage: 2628.4 Impedance: 2497.7

Mileage by State :

IA: 305.3 ID: 275.6 IL: 162.6 IN: 151.2 NE: 452.7 OH: 235.7
 OR: 208.5 PA: 251.5 UT: 149.1 WA: 35.6 WY: 400.5

Mileage by Sign Type:

1-INTERSTATE: 2600.4 2-US: 18.0 3-STATE: 10.1

Mileage by Lane Type:

1-Multi-Lane Controlled Access: 2607.7 3-Multi-Lane Divided Highway: 5.8
 5-Principle Road: 14.9

Mileage by Tribal Lands:

Total Outside Tribal Lands : 2601.6
 Total Inside Tribal Lands : 26.9

Umatilla Reservation : 26.9

TRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:

FROM: RICHLAND WA
 TO : SUSQUEHANNA NP PA

ST	MILES	>0.0	0	22.7	59.7	139	326	821	1861	3326	5815	>9996
ID	275.6	66.98	64.43	58.19	32.26	21.75	15.09	8.29	4.14	3.23	1.01	0.31
IL	162.6	19.10	37.80	30.07	23.86	18.01	12.57	9.39	5.42	3.67	2.24	0.40
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89	0.41
IA	305.3	24.97	65.83	90.05	53.91	28.93	20.76	12.84	4.41	2.60	0.81	0.20
NE	452.7	167.05	80.38	106.91	48.99	24.43	9.28	6.16	4.56	2.98	1.48	0.53
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89	0.68
OR	208.5	87.03	39.49	44.10	16.40	8.10	5.98	3.59	2.36	1.22	0.24	0.00
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46	0.12
UT	149.1	51.32	23.29	26.14	15.30	15.41	9.73	4.60	2.35	0.74	0.16	0.05
WA	35.6	24.04	1.96	1.05	0.38	0.47	1.10	1.74	2.05	1.88	0.82	0.19
WY	400.5	207.08	105.56	52.54	12.14	6.48	6.02	4.33	4.26	1.86	0.22	0.06

TOTALS
 2628.4 682.33 528.95 549.25 318.26 222.74 148.82 86.08 48.04 29.89 11.22 2.95

PERCENTAGES
 25.96 20.12 20.90 12.11 8.47 5.66 3.27 1.83 1.14 0.43 0.11

BASIS: 2000 Census data

RADTRAN Input Data	RURAL	SUBURBAN	URBAN
WEIGHTED POPULATION			
People/sq. mi.	29.6	745.8	5850.2
People/sq. km.	11.4	288.0	2258.8

DISTANCE				TOTALS
Miles	2078.8	505.7	44.1	2628.4
Kilometers	3345.4	813.8	70.9	4229.9
Percentages	79.1	19.2	1.7	

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:

ID 55406 IL 72678 IN 79041 IA 68088 NE 61587 OH 123201 OR 20611 PA 46101
 UT 22778 WA 21232 WY 32573

Total Population within 800 meter Buffer Zone: 603296

TRAGIS BBNPP CASE: IRRADIATED FUEL

TRAGIS Routing Engine Version 1.5.4 -- Highway Data Network 4.0

FROM: SUSQUEHANNA NP PA Leaving : 06/10/08 10:36
 TO : YUCCA MOUNTAIN NV Arriving : 06/12/08 03:07

Routing parameters used to calculate the route-

Routing type: HRCQ Preferred Route with 2 driver(s)
 Preferred roads Time bias: 1.00 Mile bias: 0.00, Toll bias: 1.00
 Nonpreferred roads Time bias: 0.00 Mile bias: 1.00, Toll bias: 1.00, Penalty factor: 30.0

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing
 Prohibit use of roads with Radioactive materials prohibition
 Las Vegas Beltway is considered a preferred route

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		SUSQUEHANNA NP			PA	0.0	0:00	06/10/08	10:36
12.1	U11	LIME RIDGE	NE	I80 X241	PA	12.1	0:14	06/10/08	10:50
235.4	I80	WEST MIDDLESEX	NE	I80 X4	PA	247.5	3:52	06/10/08	14:28
4.0	I80	crossing state border		OH/PA	BD	251.5	3:56	06/10/08	14:32
		Rest 30 minutes							
17.9	I80	NORTH JACKSON	NE	I76 I80	OH	269.4	4:46	06/10/08	15:22
76.0	I80 \$	ELYRIA	NW	I80 I90	OH	345.4	6:09	06/10/08	16:45
128.7	I80 \$ I90 \$	WEST JEFFERSON	N	I80 X13	OH	474.1	8:29	06/10/08	19:05
13.1	I80 \$ I90 \$	crossing state border		IN/OH	BD	487.2	8:43	06/10/08	19:19
		Rest 30 minutes							
135.4	I80 \$ I90 \$	PORTAGE	W	I80 I90	IN	622.5	11:29	06/10/08	21:05
0.5	I80	LAKE STATION	NE	I80 I94	IN	623.0	11:29	06/10/08	21:05
14.5	I80 I94	HAMMOND	W	I80 X1	IN	637.5	11:45	06/10/08	21:21
0.9	I80 I94	crossing state border		IL/IN	BD	638.4	11:46	06/10/08	21:22
3.0	I80 I94	LANSING	W	I294I94	IL	641.4	11:49	06/10/08	21:25
4.9	I294\$ I80 \$	HOMEWOOD	NW	I294I80	IL	646.3	11:54	06/10/08	21:30
		Rest 30 minutes							
154.4	I80	RAPIDS CITY	W	I80 X1	IL	800.7	15:13	06/11/08	00:49
0.3	I80	crossing state border		IA/IL	BD	801.0	15:13	06/11/08	00:49
		Rest 30 minutes							
168.0	I80	DES MOINES	N	I235I35	IA	969.0	18:19	06/11/08	03:55
14.2	I35 I80	DES MOINES	W	I235I35	IA	983.2	18:33	06/11/08	04:09
95.7	I80	MINDEN	NW	I680I80	IA	1078.8	20:01	06/11/08	05:37
16.5	I680	LOVELAND	SW	I29 I680	IA	1095.3	20:16	06/11/08	05:52
9.7	I29 I680	CRESCENT	W	I29 I680	IA	1105.0	20:25	06/11/08	06:01
3.0	I680	crossing state border		IA/NE	BD	1108.1	20:28	06/11/08	06:04
13.4	I680	OMAHA	SW	I680I80	NE	1121.4	20:43	06/11/08	06:19
		Rest 30 minutes							
		Rest 30 minutes							
422.7	I80	KIMBALL	S	I80 X20	NE	1544.1	27:22	06/11/08	11:58
20.6	I80	crossing state border		NE/WY	BD	1564.7	27:39	06/11/08	12:15
		Rest 30 minutes							
382.4	I80	EVANSTON	NE	I80 X18	WY	1947.0	33:15	06/11/08	17:51
18.2	I80	crossing state border		UT/WY	BD	1965.2	33:29	06/11/08	18:05
68.4	I80	HOLLADAY	N	I215I80	UT	2033.6	34:24	06/11/08	19:00
10.2	I215	MIDVALE		I15 I215	UT	2043.8	34:33	06/11/08	19:09
		Rest 30 minutes							
294.2	I15	SGU AIRPORT		I15 X6	UT	2338.0	39:02	06/11/08	23:38
6.4	I15	crossing state border		AZ/UT	BD	2344.4	39:07	06/11/08	23:43
		Rest 30 minutes							
20.6	I15	LITTLEFIELD		I15 X8	AZ	2365.0	39:54	06/11/08	23:30
8.6	I15	crossing state border		AZ/NV	BD	2373.7	40:01	06/11/08	23:37
73.6	I15	N LAS VEGAS	NE	I15 S215	NV	2447.3	41:01	06/12/08	00:37
14.8	C215	LAS VEGAS	NW	U95 C215	NV	2462.0	41:30	06/12/08	01:06
46.1	U95	MERCURY	S	U95 LOCL	NV	2508.1	42:16	06/12/08	01:52

33.1 LOCAL YUCCA MOUNTAIN NV 2541.2 43:31 06/12/08 03:07

Total elapsed time: 43:31 Total trip mileage: 2541.2 Impedance: 4915.1

Mileage by State :

AZ: 29.2 IA: 307.1 IL: 162.6 IN: 151.2 NE: 456.6 NV: 167.5
 OH: 235.7 PA: 251.5 UT: 379.2 WY: 400.5

Mileage by Sign Type:

1-INTERSTATE: 2435.1 2-US: 58.2 5-COUNTY: 14.8 6-LOCAL: 33.1

Mileage by Lane Type:

1-Multi-Lane Controlled Access: 2435.1 3-Multi-Lane Divided Highway: 60.9
 5-Principle Road: 12.1 7-Other: 33.1

Mileage by Tribal Lands:

Total Outside Tribal Lands : 2527.2
 Total Inside Tribal Lands : 13.9

Las Vegas Colony : 2.8 Moapa River Reservation : 9.2
 Paiute (UT) Reservation : 1.9

TRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:

FROM: SUSQUEHANNA NP PA
 TO : YUCCA MOUNTAIN NV

ST	MILES	0	>0.0	22.7	59.7	139	326	821	1861	3326	5815	>9996
AZ	29.2	16.37	10.91	1.52	0.26	0.13	0.07	0.00	0.00	0.00	0.00	0.00
IL	162.6	19.10	37.80	30.07	23.86	18.01	12.57	9.39	5.42	3.67	2.24	0.40
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89	0.41
IA	307.1	26.27	73.66	93.61	51.14	25.99	18.72	10.70	3.86	2.30	0.64	0.20
NE	456.6	167.07	80.87	107.72	49.64	24.69	10.77	7.27	4.24	2.75	1.02	0.59
NV	167.5	108.64	21.16	17.66	9.52	3.96	3.65	1.23	0.77	0.53	0.40	0.00
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89	0.68
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46	0.12
UT	379.2	118.00	70.04	66.60	38.43	23.87	17.36	14.41	10.53	10.42	8.06	1.52
WY	400.5	207.08	105.56	52.54	12.14	6.48	6.02	4.33	4.26	1.86	0.22	0.06

TOTALS

2541.2 697.29 510.21 509.92 300.01 202.29 137.45 82.47 47.57 33.24 16.82 3.98

PERCENTAGES

27.44 20.08 20.07 11.81 7.96 5.41 3.25 1.87 1.31 0.66 0.16

BASIS: 2000 Census data

RADTRAN Input Data	RURAL	SUBURBAN	URBAN
WEIGHTED POPULATION			
People/sq. mi.	28.7	765.9	6082.0
People/sq. km.	11.1	295.7	2348.3

DISTANCE				TOTALS
Miles	2017.4	469.8	54.0	2541.2
Kilometers	3246.7	756.0	87.0	4089.5
Percentages	79.4	18.5	2.1	

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:

AZ 245 IL 72678 IN 79041 IA 60053 NE 59486 NV 12582 OH 123201 PA 46101
 UT 159594 WY 32573

Total Population within 800 meter Buffer Zone: 645554

RADTRAN BBNPP CASE: IRRADIATED FUEL

RUN DATE: [11-JUN-08 AT 09:49:18]

PAGE 1

```

RRRR   AAA   DDDD   TTTT   RRRR   AAA   N   N   55555   6
R  R  A  A  D  D   T   R  R  A  A  NN  N   5           6
R  R  A  A  D  D   T   R  R  A  A  NN  N   5           6
RRRR   A  A  D  D   T   RRRR  A  A  N  NN  5555   6666
R  R   AAAAA  D  D   T   R  R   AAAAA  N  N   5           6  6
R  R   A  A  D  D   T   R  R   A  A  N  N   5  5       6  6
R  R   A  A  DDDD  T   R  R   A  A  N  N   5555   *   666
    
```

RADTRAN 5.6 February 20, 2006

INPUT ECHO

```

&& R000
TITLE Irradiated Fuel Truck from BBNPP to Yucca Mt.
INPUT STANDARD
STD: 0 10 18 && DIMEN=NSEV NRAD NAREAS
STD: 1 3 3 0 && PARM=IRNKC IANA ISEN IPSQSB
STD: .TRUE. .FALSE. && FORM = UNIT, SI-UNITS?
STD: 2.3E12 && NEVAL FOR CF252
STD: 9.25E5 5.77E6 1.27E6 && RPCTHY FOR I125, I129, I131
STD: 0.0 0.0 0.0 0.0 0.0 && TRANSFER GAMMA
STD: 7.42E-3 2.02E-2 6.17E-5 3.17E-8 0.0 && TRANSFER NEUTRON
STD: 30 24 && MITDDIST MITDVDEL
STD: 1 2 .0018 && ITRAIN FMINCL DDRWEF
STD: 33 68 105 244 369 && CENTER LINE
STD: 561 1018 1628 2308 4269 && DISTANCES
STD: 5468 11136 13097 21334 40502 && FOR AVERAGE
STD: 69986 89860 120878 0 0 0 0 0 0 0 0 0 0 0 0 && US CLOUD
STD: 4.59E+02 1.53E+03 3.94E+03 1.25E+04 3.04E+04 6.85E+04 1.76E+05 4.45E+05
STD: 8.59E+05 2.55E+06 4.45E+06 1.03E+07 2.16E+07 5.52E+07 1.77E+08 4.89E+08
STD: 8.12E+08 1.35E+09 0 0 0 0 0 0 0 0 0 0 0 && AREADA
STD: 3.42E-03 1.72E-03 8.58E-04 3.42E-04 1.72E-04 8.58E-05 3.42E-05 1.72E-05
STD: 8.58E-06 3.42E-06 1.72E-06 8.58E-07 3.42E-07 1.72E-07 8.58E-08 5.42E-08
STD: 4.30E-08 3.42E-08 0 0 0 0 0 0 0 0 0 0 0 0 && DFLEV
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 && RADIST
STD: 0.5 && SMLPKG
STD: 1.0 0.87 0.018 && SHIELDING FACTORS RR RS RU
STD: 30 30 800 && OFFLINK {FREEWAY}
STD: 27 30 800 && OFFLINK {NON-FREEWAY}
STD: 5 8 800 && OFFLINK {CITY STREETS}
STD: 30 30 800 && OFFLINK {RAILWAY}
STD: 200 200 1000 && OFFLINK {WATERWAY}
STD: 15 3 3 3 4 && ONLINK {FWAY NONFWY STREET RAIL ADJ}
STD: 6.0 4 40.0 && RPD FNOATT INTERDICT
STD: 0.05 0.2 3.3E-4 && BDF CULVL BRATE
STD: 0.9 0.1 && UBF USWF
STD: 1.0 10.0 1.0 && EVACUATION SURVEY CAMPAIGN
    
```

Irradiated Fuel Truck from BBNPP to Yucca Mt.

```

STD: 0.0 0.0 1.5E-8 5.3E-8 && HIGHWAY - RURAL - NONRAD
STD: 0.0 0.0 3.7E-9 1.3E-8 && HIGHWAY - SUBURBAN - NONRAD
STD: 0.0 0.0 2.1E-9 7.5E-9 && HIGHWAY - URBAN - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - R - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - S - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - U - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - R - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - S - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - U - NONRAD
STD: 0.0 0.0 0.0 0.0 0.0 0.0 && PSPROB
STD: 0.67 0.67 0.42 && TIMENDE NON-DISPERSAL EVAC TIME (LCF&EARLY)
STD: 2 2 1 && FLAGS=IUOPT IACC REGCHECK
STD: 5E-4, 4E-4, 1.0E-4 && LCFCON(1), LCFCON(2), GECON
STD: R5INGEST.BIN && INGESTION FILE
OUTPUT BQ_SV
FORM UNIT
DIMEN 19 10 18
PARAM 1 2 1 0
SEVERITY
NPOP=1
NMODE=1
1.53E-8
5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
0.0 1.13E-8 8.03E-11 0.0 1.44E-10
1.02E-12 0.0 7.49E-11 0.0 0.0
0.0 5.86E-6 0.99993
NPOP=2
NMODE=1
1.53E-8
5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
0.0 1.13E-8 8.03E-11 0.0 1.44E-10
1.02E-12 0.0 7.49E-11 0.0 0.0
0.0 5.86E-6 0.99993
NPOP=3
NMODE=1
1.53E-8
5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
0.0 1.13E-8 8.03E-11 0.0 1.44E-10
1.02E-12 0.0 7.49E-11 0.0 0.0
0.0 5.86E-6 0.99993
RELEASE
GROUP=Part
RFRAC
6.0E-7
1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
6.7E-7 6.8E-7 1.8E-5 9.0E-6 6.8E-7
6.8E-7 6.7E-8 0.0
AERSOL

```

```
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Cs
RFRAC
2.4E-8
4.1E-9 5.4E-9 3.6E-5 1.3E-8 1.5E-8
2.7E-5 2.4E-8 2.7E-8 5.9E-6 2.4E-8
2.7E-8 5.9E-6 9.6E-5 5.5E-5 5.9E-6
5.9E-6 1.7E-5 0.0
AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Ru
RFRAC
6.0E-7
1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
6.7E-7 6.8E-7 8.4E-5 5.0E-5 6.4E-6
6.4E-6 6.7E-8 0.0
AERSOL
1.0
```

```
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
```

0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Gas
RFRAC
0.8
0.14 0.18 0.84 0.43 0.49
0.85 0.82 0.89 0.91 0.82
0.89 0.91 0.84 0.85 0.91
0.91 0.84 0.0

AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0

DEPVEL 0.0
GROUP=Cor
RFRAC
0.0020
0.0014 0.0018 0.0032 0.0018 0.0021
0.0031 0.02 0.0022 0.0025 0.0020
0.0022 0.0025 0.0064 0.0059 0.0033
0.0033 0.0025 0.0

AERSOL
1.0
1.0 1.0 1.0 1.0 1.0

RUN DATE: [11-JUN-08 AT 09:49:18]
Irradiated Fuel Truck from BBNPP to Yucca Mt.

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1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0

LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0

DEPVEL 0.01
PACKAGE PACKAGE_1 14.0 1.0 0.0 5.2
AM242M 23.9 Part
AM243 32.2 Part
CE144 15200.0 Part
CM242 43.6 Part
CM243 32.0 Part
CM244 4830.0 Part
CM245 0.618 Part
EU154 11700.0 Part
EU155 5730.0 Part
PM147 35500.0 Part
PU238 6940.0 Part
PU239 423.0 Part

PU240 724.0 Part
 PU241 117000.0 Part
 PU242 2.28 Part
 SR90 103000.0 Part
 Y90 103000.0 Part
 SB125 5350.0 Part
 AM241 1250.0 Part
 CS134 58400.0 Cs
 CS137 142000.0 Cs
 I129 0.0465 Cs
 RU106 20500.0 Ru
 KR85 10500.0 Gas
 CO60 76.0 Cor
 END
 VEHICLE -1 VEHICLE_1 1.40E01 1.0 0.0 5.2 1.0 2.0 5.45 1.0 1.0
 PACKAGE_1 1.0
 FLAGS
 IACC 2
 IUOPT 2
 REGCHECK 1
 MODSTD
 DISTOFF FREEWAY 3.00E01 3.00E01 8.00E02
 DISTOFF SECONDARY 2.70E01 3.00E01 8.00E02
 DISTOFF STREET 5.00E00 8.00E00 8.00E02
 RUN DATE: [11-JUN-08 AT 09:49:18] PAGE 6
 Irradiated Fuel Truck from BBNPP to Yucca Mt.
 DISTON
 FREEWAY 1.50E01
 SECONDARY 3.00E00
 STREET 3.00E00
 ADJACENT 4.00E00
 BDF 5.00E-02
 BRATE 3.30E-04
 CULVL 2.00E-01
 EVACUATION 6.70E-01
 GECON 1.00E-04
 INTERDICT 8.00E00
 LCFCON 5.00E-04 4.00E-04
 SURVEY 1.00E01
 UBF 1.00E-01
 USWF 9.00E-01
 CAMPAIGN 2.01E03
 MITDDIST 3.00E01
 MITDVEL 2.40E01
 RPD 6.00E00
 RR 1.00E00
 RU 1.80E-02
 RS 8.70E-01
 SMALLPKG 5.00E-01
 RPCTHYROID
 I129 1.27E06
 EOF
 LINK LINK_1 VEHICLE_1 3246.7 88.49 1.5 11.1 530.0 3.3E-7 0.031 R 1 1.0
 LINK LINK_2 VEHICLE_1 756.0 88.49 1.5 295.7 760.0 3.3E-7 0.031 S 1 1.0
 LINK LINK_3 VEHICLE_1 87.0 88.49 1.5 2348.3 2400.0 3.3E-7 0.031 U 1 1.0
 STOP STOP_1 VEHICLE_1 30000.0 1.0 10.0 1.0 4.5
 STOP STOP_2 VEHICLE_1 340.0 10.0 800.0 0.2 4.5
 HANDLING HANDLE_1 VEHICLE_1 5.0 1.0 0.5
 EOF

Irradiated Fuel Truck from BBNPP to Yucca Mt.

NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)

	HIGHWAY		
	ACCIDENT RATE	ACCIDENTS	FATALITIES
LINK_1	3.30E-07	1.07E-03	3.32E-05
LINK_2	3.30E-07	2.49E-04	7.73E-06
LINK_3	3.30E-07	2.87E-05	8.90E-07
TOTALS:	9.90E-07	1.35E-03	4.18E-05

Irradiated Fuel Truck from BBNPP to Yucca Mt.

CALCULATIONAL INFORMATION

FOR VEHICLE_1 AREAS WITH TOTAL CONTAMINATION RATIO GREATER THAN 8.000
 (THE AREAS MARKED WITH AN 'X' ARE INTERDICTED AND HAVE
 NO 50 YEAR GROUNDSHINE DOSE AND NO INGESTION DOSE.)

AREA/SEVERITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
3	X	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
4	-	-	-	X	-	-	X	X	-	X	-	-	X	X	X	X	X	X	X	-
5	-	-	-	X	-	-	X	X	-	X	-	-	X	X	X	X	X	X	X	-
6	-	-	-	X	-	-	X	-	-	-	-	-	-	X	X	-	-	X	-	-
7	-	-	-	X	-	-	X	-	-	-	-	-	-	X	X	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Irradiated Fuel Truck from BBNPP to Yucca Mt.

ACCIDENT SUMMARY

EXPECTED VALUES OF POPULATION RISK IN PERSON-SV

	GROUND	INHALED	RESUSPD	CLOUDSH	TOTAL
LINK_1	8.88E-10	5.81E-11	6.03E-14	1.15E-12	9.48E-10
LINK_2	5.51E-09	3.61E-10	3.74E-13	7.16E-12	5.88E-09
LINK_3	2.72E-08	1.78E-09	1.85E-12	3.54E-11	2.90E-08
RURAL	8.88E-10	5.81E-11	6.03E-14	1.15E-12	9.48E-10
SUBURE	5.51E-09	3.61E-10	3.74E-13	7.16E-12	5.88E-09
URBAN	2.72E-08	1.78E-09	1.85E-12	3.54E-11	2.90E-08
TOTALS:	3.36E-08	2.20E-09	2.28E-12	4.37E-11	3.59E-08

Irradiated Fuel Truck from BBNPP to Yucca Mt.

SOCIETAL INGESTION RISK - PERSON-SV

LINK	GONADS	EFFECTIVE
LINK_1	1.96E-09	1.98E-09
TOTAL	1.96E-09	1.98E-09

SOCIETAL INGESTION RISK BY ORGAN - PERSON-SV

LINK	BREAST	LUNGS	RED MARR	BONE SUR	THYROID	REMAINDER
LINK_1	1.66E-09	1.70E-09	2.11E-09	3.19E-09	1.68E-09	2.13E-09
TOTAL	1.66E-09	1.70E-09	2.11E-09	3.19E-09	1.68E-09	2.13E-09

EXPECTED RISK VALUES - OTHER

LINK	EARLY FATALITY	EARLY MORBIDITY
LINK_1	0.00E+00	0.00E+00
LINK_2	0.00E+00	0.00E+00
LINK_3	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00

EOI
 END OF RUN
 SUCCESSFUL COMPLETION

TRAGIS BBNPP CASE: RADIOACTIVE WASTE

TRAGIS Routing Engine Version 1.5.4

-- Highway Data Network 4.0

FROM: SUSQUEHANNA NP PA Leaving : 06/11/08 10:39
 TO : HANFORD RPSTRY WA Arriving : 06/13/08 05:45

Routing parameters used to calculate the route-

Routing type: Commercial with 2 driver(s)
 Time bias: 0.70 Mile bias: 0.30, Toll bias: 1.00

Constraints used on route:
 Prohibit use of links prohibiting truck use
 Prohibit use of ferry crossing

Miles	Hwy Sign	City	Dir	Junction	State	Dist	Time	Date	Hour
0.0		SUSQUEHANNA NP			PA	0.0	0:00	06/11/08	10:39
12.1	U11	LIME RIDGE	NE	I80 X241	PA	12.1	0:14	06/11/08	10:53
235.4	I80	WEST MIDDLESEX	NE	I80 X4	PA	247.5	3:52	06/11/08	14:31
4.0	I80	crossing state border OH/PA			BD	251.5	3:56	06/11/08	14:35
		Rest 30 minutes							
17.9	I80	NORTH JACKSON	NE	I76 I80	OH	269.4	4:46	06/11/08	15:25
76.0	I80 \$	ELYRIA	NW	I80 I90	OH	345.4	6:09	06/11/08	16:48
128.7	I80 \$ I90 \$	WEST JEFFERSON	N	I80 X13	OH	474.1	8:29	06/11/08	19:08
13.1	I80 \$ I90 \$	crossing state border IN/OH			BD	487.2	8:43	06/11/08	19:22
		Rest 30 minutes							
135.4	I80 \$ I90 \$	PORTAGE	W	I80 I90	IN	622.5	11:29	06/11/08	21:08
0.5	I80	LAKE STATION	NE	I80 I94	IN	623.0	11:29	06/11/08	21:08
14.5	I80 I94	HAMMOND	W	I80 X1	IN	637.5	11:45	06/11/08	21:24
0.9	I80 I94	crossing state border IL/IN			BD	638.4	11:46	06/11/08	21:25
3.0	I80 I94	LANSING	W	I294I94	IL	641.4	11:49	06/11/08	21:28
4.9	I294\$ I80 \$	HOMWOOD	NW	I294I80	IL	646.3	11:54	06/11/08	21:33
26.9	I294\$	HILLSIDE	NW	I290I294	IL	673.2	12:24	06/11/08	22:03
15.6	I290	ROLLING MDWS	S	I290I90	IL	688.8	12:41	06/11/08	22:20
		Rest 30 minutes							
50.6	I90 \$	CHERRY VALLEY	NE	I39 I90	IL	739.4	14:06	06/11/08	23:45
17.2	I39 \$ I90 \$	SOUTH BELOIT	E	I90 S75	IL	756.6	14:25	06/12/08	00:04
0.3	I39 I90	crossing state border IL/WI			BD	756.9	14:25	06/12/08	00:04
79.3	I39 I90	PORTAGE	S	I39 I90	WI	836.2	15:40	06/12/08	01:19
63.0	I90 I94	TOMAH	E	I90 I94	WI	899.1	16:38	06/12/08	02:17
43.1	I90	LSE AIRPORT		I90 X2	WI	942.3	17:18	06/12/08	02:57
2.2	I90	crossing state border MN/WI			BD	944.5	17:20	06/12/08	02:59
		Rest 30 minutes							
273.8	I90	BEAVER CREEK	W	I90 X1	MN	1218.3	21:44	06/12/08	07:23
1.0	I90	crossing state border MN/SD			BD	1219.4	21:45	06/12/08	07:24
		Rest 30 minutes							
401.4	I90	SPEARFISH	N	I90 X10	SD	1620.8	28:07	06/12/08	12:46
10.1	I90	crossing state border SD/WY			BD	1631.0	28:15	06/12/08	12:54
		Rest 30 minutes							
		Rest 30 minutes							
534.1	I90	BUTTE	E	I15 I90	MT	2165.1	37:04	06/12/08	21:43
8.5	I15 I90	BUTTE	W	I15 I90	MT	2173.5	37:13	06/12/08	21:52
		Rest 30 minutes							
121.9	I90	FRENCHTOWN	E	I90 X96	MT	2295.4	39:38	06/13/08	00:17
96.9	I90	crossing state border ID/MT			BD	2392.3	41:14	06/13/08	01:53
60.9	I90	COEUR D'ALENE	N	I90 X12	ID	2453.2	42:11	06/13/08	01:50
11.5	I90	crossing state border ID/WA			BD	2464.7	42:21	06/13/08	02:00
		Rest 30 minutes							
79.4	I90	RITZVILLE	SW	I90 X220	WA	2544.2	44:11	06/13/08	03:50
29.8	U395	HATTON	E	U395S26	WA	2573.9	44:46	06/13/08	04:25
20.6	S26	OTHELLO	S	S24 S26	WA	2594.5	45:11	06/13/08	04:50
40.8	S24	VERNITA	SE	S24 S240	WA	2635.3	46:00	06/13/08	05:39
4.4	S240	HANFORD RPSTRY			WA	2639.7	46:06	06/13/08	05:45

Total elapsed time: 46:06 Total trip mileage: 2639.7 Impedance: 2518.4

Mileage by State :
 ID: 72.4 IL: 118.5 IN: 151.2 MN: 274.9 MT: 552.1 OH: 235.7
 PA: 251.5 SD: 411.6 WA: 174.9 WI: 187.6 WY: 209.2

Mileage by Sign Type:
 1-INTERSTATE: 2532.0 2-US: 41.9 3-STATE: 65.8

Mileage by Lane Type:
 1-Multi-Lane Controlled Access: 2532.0 5-Principle Road: 51.6
 6-Through Road: 56.0

Mileage by Tribal Lands:
 Total Outside Tribal Lands : 2581.8
 Total Inside Tribal Lands : 57.8

Crow Reservation : 55.6 Ho-Chunk Reservation : 2.2

TRAGIS Routing Engine Version 1.5.4 -- 2000 Census Data

POPULATION DENSITY within 800 meter Buffer Zone:
 FROM: SUSQUEHANNA NP PA
 TO : HANFORD RPSTRY WA

ST	MILES	>0.0	22.7	59.7	139	326	821	1861	3326	5815	>9996	
		0	-22.7	-59.7	-139	-326	-821	-1861	-3326	-5815	-9996	
ID	72.4	21.42	11.27	8.15	5.64	7.23	6.20	6.34	3.23	2.30	0.54	0.12
IL	118.5	2.78	9.52	17.48	17.44	14.08	12.84	13.47	13.43	8.94	6.78	1.80
IN	151.2	1.73	19.97	37.40	25.85	28.69	17.16	8.92	5.71	3.55	1.89	0.41
MN	274.9	48.86	54.79	98.57	41.37	15.77	10.45	3.50	0.89	0.42	0.27	0.00
MT	552.1	219.62	110.24	107.63	45.30	27.09	18.12	12.62	6.17	3.55	1.68	0.11
OH	235.7	5.72	33.46	51.22	42.02	37.15	29.12	17.51	10.25	6.65	1.89	0.68
PA	251.5	27.31	56.78	51.58	47.15	33.32	22.01	8.71	2.53	1.51	0.46	0.12
SD	411.6	162.73	102.51	79.06	30.19	17.88	10.02	5.14	2.55	0.95	0.50	0.12
WA	174.9	83.95	28.68	25.70	8.25	5.78	6.69	5.93	4.51	3.96	1.21	0.26
WI	187.6	13.63	36.05	43.56	43.83	23.75	13.41	6.51	3.45	2.56	0.68	0.17
WY	209.2	94.31	64.55	33.62	6.66	2.58	1.92	2.19	2.04	1.27	0.05	0.05
TOTALS												
	2639.7	682.06	527.82	553.97	313.70	213.32	147.94	90.84	54.76	35.66	15.95	3.84
PERCENTAGES												
		25.84	19.99	20.98	11.88	8.08	5.60	3.44	2.07	1.35	0.60	0.15

BASIS: 2000 Census data

RADTRAN Input Data RURAL SUBURBAN URBAN
 WEIGHTED POPULATION
 People/sq. mi. 29.5 785.8 5975.1
 People/sq. km. 11.4 303.4 2307.0

DISTANCE TOTALS
 Miles 2077.5 506.9 55.5 2639.7
 Kilometers 3343.4 815.7 89.2 4248.0
 Percentages 78.7 19.2 2.1

BASIS (people/sq mi.) <139 139-3326 >3326

Population within 800 meter Buffer Zone by State:
 ID 32240 IL 153793 IN 79041 MN 24787 MT 70057 OH 123201 PA 46101 SD 34521
 WA 51727 WI 43952 WY 15735

Total Population within 800 meter Buffer Zone: 675155

RADTRAN BBNPP CASE: RADIOACTIVE WASTE

RUN DATE: [16-JUN-08 AT 16:12:24] PAGE 1

```

RRRR   AAA   DDDD   TTTTT   RRRR   AAA   N   N   55555   6
R  R  A   A  D   D   T   R  R  A   A  NN  N   5   6
R  R  A   A  D   D   T   R  R  A   A  NN  N   5   6
RRRR   A   A  D   D   T   RRRR   A   A  N   NN  5555   6666
R  R   AAAAA  D   D   T   R  R   AAAAA  N   N   5   6   6
R  R   A   A  D   D   T   R  R   A   A  N   N   5   5   6   6
R  R   A   A  DDDD  T   R  R   A   A  N   N   5555   *   666
    
```

RADTRAN 5.6 February 20, 2006

INPUT ECHO

```

&& R000
TITLE Radwaste Annual Activity from BBNPP to Hanford, WA
INPUT STANDARD
STD: 0 10 18 && DIMEN=NSEV NRAD NAREAS
STD: 1 3 3 0 && PARM=IRNKC IANA ISEN IPSQSB
STD: .TRUE. .FALSE. && FORM = UNIT, SI-UNITS?
STD: 2.3E12 && NEVAL FOR CF252
STD: 9.25E5 5.77E6 1.27E6 && RPCTHY FOR I125, I129, I131
STD: 0.0 0.0 0.0 0.0 0.0 && TRANSFER GAMMA
STD: 7.42E-3 2.02E-2 6.17E-5 3.17E-8 0.0 && TRANSFER NEUTRON
STD: 30 24 && MITDDIST MITDVEL
STD: 1 2 .0018 && ITRAIN FMINCL DDRWEF
STD: 33 68 105 244 369 && CENTER LINE
STD: 561 1018 1628 2308 4269 && DISTANCES
STD: 5468 11136 13097 21334 40502 && FOR AVERAGE
STD: 69986 89860 120878 0 0 0 0 0 0 0 0 0 0 0 0 && US CLOUD
STD: 4.59E+02 1.53E+03 3.94E+03 1.25E+04 3.04E+04 6.85E+04 1.76E+05 4.45E+05
STD: 8.59E+05 2.55E+06 4.45E+06 1.03E+07 2.16E+07 5.52E+07 1.77E+08 4.89E+08
STD: 8.12E+08 1.35E+09 0 0 0 0 0 0 0 0 0 0 && AREADA
STD: 3.42E-03 1.72E-03 8.58E-04 3.42E-04 1.72E-04 8.58E-05 3.42E-05 1.72E-05
STD: 8.58E-06 3.42E-06 1.72E-06 8.58E-07 3.42E-07 1.72E-07 8.58E-08 5.42E-08
STD: 4.30E-08 3.42E-08 0 0 0 0 0 0 0 0 0 0 && DFLEV
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 0
STD: 3 6 9 12 15 30 61 91 152 305 0 0 0 0 && RADIST
STD: 0.5 && SMLPKG
STD: 1.0 0.87 0.018 && SHIELDING FACTORS RR RS RU
STD: 30 30 800 && OFFLINK {FREEWAY}
STD: 27 30 800 && OFFLINK {NON-FREEWAY}
STD: 5 8 800 && OFFLINK {CITY STREETS}
STD: 30 30 800 && OFFLINK {RAILWAY}
STD: 200 200 1000 && OFFLINK {WATERWAY}
STD: 15 3 3 3 4 && ONLINK {FWAY NONFWY STREET RAIL ADJ}
STD: 6.0 4 40.0 && RPD FNOATT INTERDICT
STD: 0.05 0.2 3.3E-4 && BDF CULVL BRATE
STD: 0.9 0.1 && UBF USWF
STD: 1.0 10.0 1.0 && EVACUATION SURVEY CAMPAIGN
    
```

Radwaste Annual Activity from BBNPP to Hanford, WA

```

STD: 0.0 0.0 1.5E-8 5.3E-8 && HIGHWAY - RURAL - NONRAD
STD: 0.0 0.0 3.7E-9 1.3E-8 && HIGHWAY - SUBURBAN - NONRAD
STD: 0.0 0.0 2.1E-9 7.5E-9 && HIGHWAY - URBAN - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - R - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - S - NONRAD
STD: 0.0 0.0 1.81E-9 2.64E-8 && GENERAL FREIGHT - U - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - R - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - S - NONRAD
STD: 0.0 0.0 1.27E-7 1.85E-6 && DEDICATED RAIL - U - NONRAD
STD: 0.0 0.0 0.0 0.0 0.0 0.0 && PSPROB
STD: 0.67 0.67 0.42 && TIMENDE NON-DISPERSAL EVAC TIME (LCF&EARLY)
STD: 2 2 1 && FLAGS=IUOPT IACC REGCHECK
STD: 5E-4, 4E-4, 1.0E-4 && LCFCO(1), LCFCO(2), GECON
STD: R5INGEST.BIN && INGESTION FILE
OUTPUT BQ_SV
FORM UNIT
DIMEN 19 10 18
PARM 1 2 1 0
SEVERITY
  NPOP=1
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
  NPOP=2
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
  NPOP=3
    NMODE=1
      1.53E-8
    5.88E-5 1.81E-6 7.49E-8 4.65E-7 3.31E-9
    0.0 1.13E-8 8.03E-11 0.0 1.44E-10
    1.02E-12 0.0 7.49E-11 0.0 0.0
    0.0 5.86E-6 0.99993
RELEASE
  GROUP=Part
    RFRAC
      6.0E-7
    1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
    2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
    6.7E-7 6.8E-7 1.8E-5 9.0E-6 6.8E-7
    6.8E-7 6.7E-8 0.0
    AERSOL

```

```
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Cs
RFRAC
2.4E-8
4.1E-9 5.4E-9 3.6E-5 1.3E-8 1.5E-8
2.7E-5 2.4E-8 2.7E-8 5.9E-6 2.4E-8
2.7E-8 5.9E-6 9.6E-5 5.5E-5 5.9E-6
5.9E-6 1.7E-5 0.0
AERSOL
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
DEPVEL 0.01
GROUP=Ru
RFRAC
6.0E-7
1.0E-7 1.3E-7 3.8E-6 3.2E-7 3.7E-7
2.1E-6 6.1E-7 6.7E-7 6.8E-7 6.1E-7
6.7E-7 6.8E-7 8.4E-5 5.0E-5 6.4E-6
6.4E-6 6.7E-8 0.0
AERSOL
1.0
```

```
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
RESP
1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
LOS
0.0
0.0 0.0 0.0 0.0 0.0
```

```

0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
  DEPVEL 0.01
  GROUP=Cor
  RFRAC
    0.0020
0.0014 0.0018 0.0032 0.0018 0.0021
0.0031 0.02 0.0022 0.0025 0.0020
0.0022 0.0025 0.0064 0.0059 0.0033
0.0033 0.0025 0.0
  AERSOL
    1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
  RESP
    1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0 1.0 1.0
1.0 1.0 1.0
  LOS
    0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.0
  DEPVEL 0.01
PACKAGE PACKAGE_1 14.0 1.0 0.0 5.2
  CE144 0.775 Part
  PU241 0.339 Part
  SB124 0.0114 Part
  SB125 0.0374 Part
  SR89 0.0133 Part
  SR90 2.64 Part
  Y90 2.55 Part
  CS134 184.0 Cs
  CS137 349.0 Cs

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RUN DATE: [16-JUN-08 AT 16:12:24]

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Radwaste Annual Activity from BBNPP to Hanford, WA

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I129 9.06E-4 Cs
I131 0.00916 Cs
RU106 20.8 Ru
RU103 12.5 Ru
CO60 237.0 Cor
CO58 114.0 Cor
FE55 473.0 Cor
MN54 360.0 Cor
ZN65 93.4 Cor
END
VEHICLE -1 VEHICLE_1 1.40E01 1.0 0.0 5.2 1.0 2.0 5.45 1.0 1.0
  PACKAGE_1 1.0
FLAGS
  IACC 2
  IUOPT 2
  REGCHECK 1
MODSTD
  DISTOFF FREEWAY 3.00E01 3.00E01 8.00E02
  DISTOFF SECONDARY 2.70E01 3.00E01 8.00E02
  DISTOFF STREET 5.00E00 8.00E00 8.00E02
  DISTON
    FREEWAY 1.50E01
    SECONDARY 3.00E00
    STREET 3.00E00
    ADJACENT 4.00E00
  BDF 5.00E-02
  BRATE 3.30E-04

```

CULVL 2.00E-01
EVACUATION 6.70E-01
GECON 1.00E-04
INTERDICT 8.00E00
LCFCON 5.00E-04 4.00E-04
SURVEY 1.00E01
UBF 1.00E-01
USWF 9.00E-01
CAMPAIGN 2.01E03
MITDDIST 3.00E01
MITDVEL 2.40E01
RPD 6.00E00
RR 1.00E00
RU 1.80E-02
RS 8.70E-01
SMALLPKG 5.00E-01
RPCTHYROID
I129 1.27E06
EOF
LINK LINK_1 VEHICLE_1 3343.4 88.49 1.5 11.4 530.0 3.81E-7 0.0216 R 1 1.0
LINK LINK_2 VEHICLE_1 815.7 88.49 1.5 303.4 760.0 3.81E-7 0.0216 S 1 1.0
LINK LINK_3 VEHICLE_1 89.2 88.49 1.5 2307.0 2400.0 3.81E-7 0.0216 U 1 1.0

STOP STOP_1 VEHICLE_1 30000.0 1.0 10.0 1.0 5.0
STOP STOP_2 VEHICLE_1 340.0 10.0 800.0 0.2 5.0

HANDLING HANDLE_1 VEHICLE_1 5.0 1.0 0.5

EOF

Radwaste Annual Activity from BBNPP to Hanford, WA

NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)

		HIGHWAY	
	ACCIDENT RATE	ACCIDENTS	FATALITIES
LINK_1	3.81E-07	1.27E-03	2.75E-05
LINK_2	3.81E-07	3.11E-04	6.71E-06
LINK_3	3.81E-07	3.40E-05	7.34E-07
TOTALS:	1.14E-06	1.62E-03	3.50E-05

Radwaste Annual Activity from BBNPP to Hanford, WA

CALCULATIONAL INFORMATION

FOR VEHICLE_1 AREAS WITH TOTAL CONTAMINATION RATIO GREATER THAN 8.000
(THE AREAS MARKED WITH AN 'X' ARE INTERDICTED AND HAVE
NO 50 YEAR GROUNDSHINE DOSE AND NO INGESTION DOSE.)

AREA/SEVERITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
6	X	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
7	-	-	-	-	-	-	-	X	-	-	-	-	-	X	X	-	-	-	-	-
8	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Radwaste Annual Activity from BBNPP to Hanford, WA

ACCIDENT SUMMARY
 ***** *****

EXPECTED VALUES OF POPULATION RISK IN PERSON-SV

	GROUND	INHALED	RESUSPD	CLOUDSH	TOTAL
LINK_1	1.43E-09	4.98E-12	4.77E-16	2.32E-13	1.43E-09
LINK_2	9.27E-09	3.23E-11	3.10E-15	1.51E-12	9.31E-09
LINK_3	4.17E-08	1.45E-10	1.39E-14	6.77E-12	4.18E-08
RURAL	1.43E-09	4.98E-12	4.77E-16	2.32E-13	1.43E-09
SUBURE	9.27E-09	3.23E-11	3.10E-15	1.51E-12	9.31E-09
URBAN	4.17E-08	1.45E-10	1.39E-14	6.77E-12	4.18E-08
TOTALS:	5.24E-08	1.83E-10	1.75E-14	8.51E-12	5.26E-08

Radwaste Annual Activity from BBNPP to Hanford, WA

SOCIETAL INGESTION RISK - PERSON-SV

LINK	GONADS	EFFECTIVE
LINK_1	6.33E-10	6.40E-10
TOTAL	6.33E-10	6.40E-10

SOCIETAL INGESTION RISK BY ORGAN - PERSON-SV

LINK	BREAST	LUNGS	RED MARR	BONE SUR	THYROID	REMAINDER
LINK_1	4.41E-10	4.03E-10	5.88E-10	5.62E-10	4.10E-10	8.93E-10
TOTAL	4.41E-10	4.03E-10	5.88E-10	5.62E-10	4.10E-10	8.93E-10

EXPECTED RISK VALUES - OTHER

LINK	EARLY FATALITY	EARLY MORBIDITY
LINK_1	0.00E+00	0.00E+00
LINK_2	0.00E+00	0.00E+00
LINK_3	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00

EOI
 END OF RUN
 SUCCESSFUL COMPLETION