

'Co-60 Group 2'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

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NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 6.39E+01  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 6.39E+01  
THICKNESS OF SOURCE (m) 2.93E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 1.00E+01  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 1.00E+00  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.35E-05  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 1.00E+00  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 3.19E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 3.77E+30

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

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LEACH RATE CONSTANT (1/y) 2.2148E-03  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 2.0000E+01  
RETARDATION FACTOR (UNSATURATED) 5.6341E+00  
SOLUBILITY LIMITED MASS (mg) 1.8436E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 6.5963E-22  
TRANSIT TIME IN UNSAT ZONE (years) 1.3398E+02  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 4.81E-16 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 4.49E-16 Ci/L

PEAK TIME (y): 1.407023E+02

LIMITING SOIL CONCENTRATION (Ci/m**3):	1.509E+04
LIMITING SOIL CONCENTRATION (Ci/kg):	1.006E+01
LIMITING INVENTORY IN SOIL (Ci):	1.805E+08
LIMITING INVENTORY IN SOIL (mg):	5.046E+43
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'Cs-137 Group 2'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL: 1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 6.39E+01  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 6.39E+01  
THICKNESS OF SOURCE (m) 2.93E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 5.00E+02  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 5.00E+01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.43E-06  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 5.00E+01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 3.19E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 4.00E+29

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

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LEACH RATE CONSTANT (1/y) 4.5481E-05  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 9.5100E+02  
RETARDATION FACTOR (UNSATURATED) 2.3271E+02  
SOLUBILITY LIMITED MASS (mg) 8.9778E+15  
SOLUBILITY LIMITED ACTIVITY (Ci) 3.2122E-20  
TRANSIT TIME IN UNSAT ZONE (years) 5.5338E+03  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

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>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

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>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.05E-18 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 1.05E-18 Ci/L

PEAK TIME (y): 5.853427E+03

LIMITING SOIL CONCENTRATION (Ci/m**3):	6.853E+05
LIMITING SOIL CONCENTRATION (Ci/kg):	4.568E+02
LIMITING INVENTORY IN SOIL (Ci):	8.198E+09
LIMITING INVENTORY IN SOIL (mg):	2.291E+45
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'Pu-238 Group 2'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

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NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	6.39E+01
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	6.39E+01
THICKNESS OF SOURCE (m)	2.93E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	1.50E+03
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	1.50E+02
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	4.02E-07
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	1.50E+02
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	3.19E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 1.12E+29

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

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LEACH RATE CONSTANT (1/y)	1.5166E-05
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	2.8510E+03
RETARDATION FACTOR (UNSATURATED)	6.9612E+02
SOLUBILITY LIMITED MASS (mg)	2.6923E+16
SOLUBILITY LIMITED ACTIVITY (Ci)	9.6330E-20
TRANSIT TIME IN UNSAT ZONE (years)	1.6554E+04
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 9.81E-20 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 9.81E-20 Ci/L

PEAK TIME (y): 1.751205E+04

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 2.055E+06  
LIMITING SOIL CONCENTRATION (Ci/kg): 1.370E+03  
LIMITING INVENTORY IN SOIL (Ci): 2.458E+10  
LIMITING INVENTORY IN SOIL (mg): 6.871E+45  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33

'U-234 Group 2'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 6.39E+01  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 6.39E+01  
THICKNESS OF SOURCE (m) 2.93E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 6.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 6.00E-01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.74E-06  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 6.00E-01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 3.19E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 4.86E+29

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

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LEACH RATE CONSTANT (1/y) 3.6270E-03  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.2400E+01  
RETARDATION FACTOR (UNSATURATED) 3.7805E+00  
SOLUBILITY LIMITED MASS (mg) 1.1258E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 4.0280E-22  
TRANSIT TIME IN UNSAT ZONE (years) 8.9900E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.02E-16 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 9.47E-17 Ci/L

PEAK TIME (y): 9.406784E+01

LIMITING SOIL CONCENTRATION (Ci/m**3):	9.212E+03
LIMITING SOIL CONCENTRATION (Ci/kg):	6.141E+00
LIMITING INVENTORY IN SOIL (Ci):	1.102E+08
LIMITING INVENTORY IN SOIL (mg):	3.080E+43
SPECIFIC ACTIVITY (Ci/g):	3.578E-33



'U-238 Group 2'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL: 1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 6.39E+01  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 6.39E+01  
THICKNESS OF SOURCE (m) 2.93E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 6.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 6.00E-01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.82E-06  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 6.00E-01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 3.19E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 5.09E+29

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 3.6270E-03  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.2400E+01  
RETARDATION FACTOR (UNSATURATED) 3.7805E+00  
SOLUBILITY LIMITED MASS (mg) 1.1258E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 4.0280E-22  
TRANSIT TIME IN UNSAT ZONE (years) 8.9900E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

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>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

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>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.06E-16 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 9.91E-17 Ci/L

PEAK TIME (y): 9.406784E+01

LIMITING SOIL CONCENTRATION (Ci/m**3):	9.212E+03
LIMITING SOIL CONCENTRATION (Ci/kg):	6.141E+00
LIMITING INVENTORY IN SOIL (Ci):	1.102E+08
LIMITING INVENTORY IN SOIL (mg):	3.080E+43
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'Chromium Group 3'

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GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 4

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 1.32E+02  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 1.32E+02  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 1.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 1.00E-01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 6.88E+08  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 1.00E-01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 6.60E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING CONTAMINANT GW CONCENTRATION (mg/L) 6.00E-03  
UNITS OF CONTAMINANT mg

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LIMITING SOIL CONCENTRATION CALCULATION

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 1.7166E-02  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 2.9000E+00  
RETARDATION FACTOR (UNSATURATED) 1.4634E+00  
SOLUBILITY LIMITED MASS (mg) 1.0150E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 0.0000E+00  
TRANSIT TIME IN UNSAT ZONE (years) 3.4800E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*  
MAXIMUM NON RADIOLOGICAL CONTAMINANT CALCULATION  
MAXIMUM CONCENTRATION 1.00E-01 mg/L  
AVERAGE CONCENTRATION 7.92E-02 mg/L  
PEAK TIME (y): 3.629863E+01  
LIMITING SOIL CONCENTRATION (mg/m\*\*3): 9.810E+02  
LIMITING SOIL CONCENTRATION (mg/kg): 6.540E-01

LIMITING INVENTORY IN SOIL (mg): 5.213E+07

'Co-60 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL: 1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	1.32E+02
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	1.32E+02
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	1.00E+01
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	1.00E+00
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	1.92E-09
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	1.00E+00
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	6.60E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 5.37E+26

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*

LEACH RATE CONSTANT (1/y)	2.1276E-03
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	2.0000E+01
RETARDATION FACTOR (UNSATURATED)	5.6341E+00
SOLUBILITY LIMITED MASS (mg)	8.1894E+14
SOLUBILITY LIMITED ACTIVITY (Ci)	2.9301E-21
TRANSIT TIME IN UNSAT ZONE (years)	1.3398E+02
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*

INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 3.47E-20 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 3.11E-20 Ci/L

PEAK TIME (y): 1.445115E+02

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 6.972E+03  
LIMITING SOIL CONCENTRATION (Ci/kg): 4.648E+00  
LIMITING INVENTORY IN SOIL (Ci): 3.705E+08  
LIMITING INVENTORY IN SOIL (mg): 1.036E+44  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33

'Cs-137 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	1.32E+02
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	1.32E+02
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	5.00E+02
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	5.00E+01
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	4.18E-06
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	5.00E+01
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	6.60E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 1.17E+30

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*

LEACH RATE CONSTANT (1/y)	4.3692E-05
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	9.5100E+02
RETARDATION FACTOR (UNSATURATED)	2.3271E+02
SOLUBILITY LIMITED MASS (mg)	3.9879E+16
SOLUBILITY LIMITED ACTIVITY (Ci)	1.4268E-19
TRANSIT TIME IN UNSAT ZONE (years)	5.5338E+03
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*

INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.55E-18 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 1.55E-18 Ci/L

PEAK TIME (y): 6.037722E+03

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 3.037E+05  
LIMITING SOIL CONCENTRATION (Ci/kg): 2.025E+02  
LIMITING INVENTORY IN SOIL (Ci): 1.614E+10  
LIMITING INVENTORY IN SOIL (mg): 4.511E+45  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33



'Pu-238 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	1.32E+02
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	1.32E+02
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	1.50E+03
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	1.50E+02
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	2.40E-08
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	1.50E+02
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	6.60E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 6.71E+27

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*

LEACH RATE CONSTANT (1/y)	1.4569E-05
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	2.8510E+03
RETARDATION FACTOR (UNSATURATED)	6.9612E+02
SOLUBILITY LIMITED MASS (mg)	1.1959E+17
SOLUBILITY LIMITED ACTIVITY (Ci)	4.2790E-19
TRANSIT TIME IN UNSAT ZONE (years)	1.6554E+04
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

-----  
>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*

INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

-----  
>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 2.97E-21 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 2.97E-21 Ci/L

PEAK TIME (y): 1.806455E+04

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 9.108E+05  
LIMITING SOIL CONCENTRATION (Ci/kg): 6.072E+02  
LIMITING INVENTORY IN SOIL (Ci): 4.840E+10  
LIMITING INVENTORY IN SOIL (mg): 1.353E+46  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33

'Sr-90 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	1.32E+02
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	1.32E+02
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	2.40E+01
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	2.40E+00
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	8.52E-09
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	2.40E+00
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	6.60E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 2.38E+27

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*

LEACH RATE CONSTANT (1/y)	9.0049E-04
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	4.6600E+01
RETARDATION FACTOR (UNSATURATED)	1.2122E+01
SOLUBILITY LIMITED MASS (mg)	1.9349E+15
SOLUBILITY LIMITED ACTIVITY (Ci)	6.9231E-21
TRANSIT TIME IN UNSAT ZONE (years)	2.8826E+02
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*

INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 6.53E-20 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 6.36E-20 Ci/L

PEAK TIME (y): 3.129226E+02

LIMITING SOIL CONCENTRATION (Ci/m**3):	1.513E+04
LIMITING SOIL CONCENTRATION (Ci/kg):	1.009E+01
LIMITING INVENTORY IN SOIL (Ci):	8.042E+08
LIMITING INVENTORY IN SOIL (mg):	2.248E+44
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'U-234 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL: 1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 1.32E+02  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 1.32E+02  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 6.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 6.00E-01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 9.59E-08  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 6.00E-01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 6.60E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 2.68E+28

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 3.4843E-03  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.2400E+01  
RETARDATION FACTOR (UNSATURATED) 3.7805E+00  
SOLUBILITY LIMITED MASS (mg) 5.0008E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 1.7892E-21  
TRANSIT TIME IN UNSAT ZONE (years) 8.9900E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

-----  
>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

-----  
>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 2.84E-18 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 2.59E-18 Ci/L

PEAK TIME (y): 9.634099E+01

LIMITING SOIL CONCENTRATION (Ci/m**3):	4.175E+03
LIMITING SOIL CONCENTRATION (Ci/kg):	2.783E+00
LIMITING INVENTORY IN SOIL (Ci):	2.218E+08
LIMITING INVENTORY IN SOIL (mg):	6.200E+43
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'U-235 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 1.32E+02  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 1.32E+02  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 6.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 6.00E-01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 5.86E-09  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 6.00E-01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 6.60E+01  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L) 6.00E-03  
UNITS OF CONTAMINANT Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 1.64E+27

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 3.4843E-03  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.2400E+01  
RETARDATION FACTOR (UNSATURATED) 3.7805E+00  
SOLUBILITY LIMITED MASS (mg) 5.0008E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 1.7892E-21  
TRANSIT TIME IN UNSAT ZONE (years) 8.9900E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.74E-19 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 1.58E-19 Ci/L

PEAK TIME (y): 9.634099E+01

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 4.175E+03  
LIMITING SOIL CONCENTRATION (Ci/kg): 2.783E+00  
LIMITING INVENTORY IN SOIL (Ci): 2.218E+08  
LIMITING INVENTORY IN SOIL (mg): 6.200E+43  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33



'U-238 Group 3'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	1.32E+02
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	1.32E+02
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	6.00E+00
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	6.00E-01
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**--1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	7.19E-09
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	6.00E-01
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	6.60E+01
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 2.01E+27

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*

LEACH RATE CONSTANT (1/y)	3.4843E-03
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	1.2400E+01
RETARDATION FACTOR (UNSATURATED)	3.7805E+00
SOLUBILITY LIMITED MASS (mg)	5.0008E+14
SOLUBILITY LIMITED ACTIVITY (Ci)	1.7892E-21
TRANSIT TIME IN UNSAT ZONE (years)	8.9900E+01
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*

INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*

MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 2.13E-19 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 1.94E-19 Ci/L

PEAK TIME (y): 9.634099E+01

LIMITING SOIL CONCENTRATION (Ci/m**3):	4.175E+03
LIMITING SOIL CONCENTRATION (Ci/kg):	2.783E+00
LIMITING INVENTORY IN SOIL (Ci):	2.218E+08
LIMITING INVENTORY IN SOIL (mg):	6.200E+43
SPECIFIC ACTIVITY (Ci/g):	3.578E-33

'Lead Group 4'

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 4

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 1.60E+01  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 1.60E+01  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 1.00E+02  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 1.00E+01  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*<sup>-1</sup>) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 3.72E+07  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 1.00E+01  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 8.00E+00  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING CONTAMINANT GW CONCENTRATION (mg/L) 6.00E-03  
UNITS OF CONTAMINANT mg

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 2.1798E-04  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.9100E+02  
RETARDATION FACTOR (UNSATURATED) 4.7341E+01  
SOLUBILITY LIMITED MASS (mg) 1.1744E+14  
SOLUBILITY LIMITED ACTIVITY (Ci) 0.0000E+00  
TRANSIT TIME IN UNSAT ZONE (years) 1.1258E+03  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*  
MAXIMUM NON RADIOLOGICAL CONTAMINANT CALCULATION  
MAXIMUM CONCENTRATION 3.03E-04 mg/L  
AVERAGE CONCENTRATION 2.78E-04 mg/L  
PEAK TIME (y): 1.141855E+03  
LIMITING SOIL CONCENTRATION (mg/m\*\*3): 1.030E+06  
LIMITING SOIL CONCENTRATION (mg/kg): 6.867E+02

LIMITING INVENTORY IN SOIL (mg) : 8.043E+08

'Chloride Group 5'

TITLE

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 4

KFLAG: 1 (0) CONC VS TIME; (1) PEAK CONC AND LIMITING SOIL CONC

IMODEL: 1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 5.49E+00  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 5.49E+00  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 0.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 0.00E+00  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.78E+05  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 0.00E+00  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 2.59E+00  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING CONTAMINANT GW CONCENTRATION (mg/L) 6.00E-03  
UNITS OF CONTAMINANT mg

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 7.9968E-02  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.0000E+00  
RETARDATION FACTOR (UNSATURATED) 1.0000E+00  
SOLUBILITY LIMITED MASS (mg) 3.7690E+10  
SOLUBILITY LIMITED ACTIVITY (Ci) 0.0000E+00  
TRANSIT TIME IN UNSAT ZONE (years) 2.3780E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*  
MAXIMUM NON RADIOLOGICAL CONTAMINANT CALCULATION  
MAXIMUM CONCENTRATION 7.80E-04 mg/L  
AVERAGE CONCENTRATION 3.26E-04 mg/L  
PEAK TIME (y): 2.380833E+01  
LIMITING SOIL CONCENTRATION (mg/m\*\*3): 3.564E+04  
LIMITING SOIL CONCENTRATION (mg/kg): 2.376E+01

LIMITING INVENTORY IN SOIL (mg) : 3.276E+06

'Orthophosphate Group 5'

TITLE

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 4

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2) POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 5.49E+00  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 5.49E+00  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 0.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 0.00E+00  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 1.90E+05  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 0.00E+00  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 2.59E+00  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING CONTAMINANT GW CONCENTRATION (mg/L) 6.00E-03  
UNITS OF CONTAMINANT mg

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 7.9968E-02  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.0000E+00  
RETARDATION FACTOR (UNSATURATED) 1.0000E+00  
SOLUBILITY LIMITED MASS (mg) 3.7690E+10  
SOLUBILITY LIMITED ACTIVITY (Ci) 0.0000E+00  
TRANSIT TIME IN UNSAT ZONE (years) 2.3780E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*  
MAXIMUM NON RADIOLOGICAL CONTAMINANT CALCULATION  
MAXIMUM CONCENTRATION 8.33E-04 mg/L  
AVERAGE CONCENTRATION 3.48E-04 mg/L  
PEAK TIME (y): 2.380833E+01  
LIMITING SOIL CONCENTRATION (mg/m\*\*3): 3.564E+04  
LIMITING SOIL CONCENTRATION (mg/kg): 2.376E+01

LIMITING INVENTORY IN SOIL (mg) : 3.276E+06



'Sulfate Group 5'

TITLE

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 4

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*  
NUMBER OF RADIOACTIVE PROGENY 0  
LENGTH OF SOURCE PARALLEL TO GW FLOW (m) 5.49E+00  
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m) 5.49E+00  
THICKNESS OF SOURCE (m) 3.05E+00  
PERCOLATION RATE (darcy vel m/y) 1.00E-01  
VOLUMETRIC WATER CONTENT IN SOURCE 4.10E-01  
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE 4.10E-01  
BULK DENSITY AT SOURCE (g/cm\*\*3) 1.50E+00  
SORPTION COEFFICIENT AT SOURCE (ml/g) 0.00E+00  
BULK DENSITY IN UNSAT ZONE (g/cm\*\*3) 1.90E+00  
UNSATURATED ZONE THICKNESS (m) 5.80E+00  
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g) 0.00E+00  
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y\*\*-1) 0.00E+00  
INITIAL MASS OR ACTIVITY (mg or Ci) 3.56E+05  
MOLECULAR WEIGHT (g/mole) 1.00E+00  
SOLUBILITY LIMIT (mg/L) 1.00E+06  
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y) 1.00E+38  
BULK DENSITY OF AQUIFER (g/cm\*\*3) 1.90E+00  
POROSITY OF AQUIFER 1.00E-01  
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g) 0.00E+00  
DISPERSIVITY X DIRECTION (m) 9.00E+00  
DISPERSIVITY Y DIRECTION (m) 4.00E+00  
PORE VELOCITY (m/y) 5.70E+02  
WELL SCREEN THICKNESS (m) 1.50E+01  
DISTANCE TO RECEPTOR ALONG X AXIS (m) 2.59E+00  
DISTANCE TO RECEPTOR ALONG Y AXIS (m) 0.00E+00  
LIMITING CONTAMINANT GW CONCENTRATION (mg/L) 6.00E-03  
UNITS OF CONTAMINANT mg

-----  
LIMITING SOIL CONCENTRATION CALCULATION

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

\*\*\*\*\*  
LEACH RATE CONSTANT (1/y) 7.9968E-02  
UNSATURATED PORE VELOCITY (m/y) 2.4390E-01  
DECAY CONSTANT(S) (1/y) 6.9315E-39  
RETARDATION FACTOR(S) (SATURATED) 1.0000E+00  
RETARDATION FACTOR (UNSATURATED) 1.0000E+00  
SOLUBILITY LIMITED MASS (mg) 3.7690E+10  
SOLUBILITY LIMITED ACTIVITY (Ci) 0.0000E+00  
TRANSIT TIME IN UNSAT ZONE (years) 2.3780E+01  
FRACTION DECAYED DURING UNSAT TRANSPORT 0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

\*\*\*\*\*  
INTEGRATION TIME (years) 30  
BODY WEIGHT (kg) 7.000E+01  
AVERAGING TIME (days) 2.550E+04  
WATER INTAKE RATE (L/d) 2.000E+00  
EXPOSURE FREQUENCY (days/year) 3.500E+02  
EXPOSURE DURATION (years) 3.000E+01  
RADIOLOGICAL DOSE LIMIT (rem/y) 4.000E-03  
CARCINOGENIC RISK CRITERIA 1.000E-04  
HAZARD QUOTIENT 1.000E+00

>>> RESULTS OF CALCULATIONS

\*\*\*\*\*  
MAXIMUM NON RADIOLOGICAL CONTAMINANT CALCULATION  
MAXIMUM CONCENTRATION 1.56E-03 mg/L  
AVERAGE CONCENTRATION 6.52E-04 mg/L  
PEAK TIME (y): 2.380833E+01  
LIMITING SOIL CONCENTRATION (mg/m\*\*3): 3.564E+04  
LIMITING SOIL CONCENTRATION (mg/kg): 2.376E+01

LIMITING INVENTORY IN SOIL (mg) : 3.276E+06

'Co-60 Group 5'

TITLE

-----  
GAUSSIAN QUADRATURE SOLUTION

MODEL OPTIONS

IMODE: 3

KFLAG: 1 (0)CONC VS TIME; (1)PEAK CONC AND LIMITING SOIL CONC

IMODEL:1 (1) SURF OR BURIED SOURCE; (2)POND SOURCE; (3) TABULATED SOURCE FUNCTION

>>> INPUT DATA

\*\*\*\*\*

NUMBER OF RADIOACTIVE PROGENY	0
LENGTH OF SOURCE PARALLEL TO GW FLOW (m)	5.49E+00
WIDTH OF SOURCE PERPENDICULAR TO GW FLOW (m)	5.49E+00
THICKNESS OF SOURCE (m)	3.05E+00
PERCOLATION RATE (darcy vel m/y)	1.00E-01
VOLUMETRIC WATER CONTENT IN SOURCE	4.10E-01
VOLUMETRIC WATER CONTENT IN UNSATURATED ZONE	4.10E-01
BULK DENSITY AT SOURCE (g/cm**3)	1.50E+00
SORPTION COEFFICIENT AT SOURCE (ml/g)	1.00E+01
BULK DENSITY IN UNSAT ZONE (g/cm**3)	1.90E+00
UNSATURATED ZONE THICKNESS (m)	5.80E+00
SORPTION COEFFICIENT IN UNSAT ZONE (ml/g)	1.00E+00
OPTIONAL LOSS RATE CONSTANT FOR SOURCE (y**-1)	0.00E+00
INITIAL MASS OR ACTIVITY (mg or Ci)	1.52E-07
MOLECULAR WEIGHT (g/mole)	1.00E+00
SOLUBILITY LIMIT (mg/L)	1.00E+06
HALF-LIFE(S) OF CONTAMINANT AND PROGENY (y)	1.00E+38
BULK DENSITY OF AQUIFER (g/cm**3)	1.90E+00
POROSITY OF AQUIFER	1.00E-01
SORPTION COEFFICIENT(S) IN AQUIFER (ml/g)	1.00E+00
DISPERSIVITY X DIRECTION (m)	9.00E+00
DISPERSIVITY Y DIRECTION (m)	4.00E+00
PORE VELOCITY (m/y)	5.70E+02
WELL SCREEN THICKNESS (m)	1.50E+01
DISTANCE TO RECEPTOR ALONG X AXIS (m)	2.59E+00
DISTANCE TO RECEPTOR ALONG Y AXIS (m)	0.00E+00
LIMITING RADIONUCLIDE GW CONCENTRATION (Ci/L)	6.00E-03
UNITS OF CONTAMINANT	Ci

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LIMITING SOIL CONCENTRATION CALCULATION

>>> INITIAL ACTIVITY CONVERTED TO MASS (mg) 4.25E+28

>>> VALUES CALCULATED IN SOURCE SUBROUTINE

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LEACH RATE CONSTANT (1/y)	2.1276E-03
UNSATURATED PORE VELOCITY (m/y)	2.4390E-01
DECAY CONSTANT(S) (1/y)	6.9315E-39
RETARDATION FACTOR(S) (SATURATED)	2.0000E+01
RETARDATION FACTOR (UNSATURATED)	5.6341E+00
SOLUBILITY LIMITED MASS (mg)	1.4166E+12
SOLUBILITY LIMITED ACTIVITY (Ci)	5.0685E-24
TRANSIT TIME IN UNSAT ZONE (years)	1.3398E+02
FRACTION DECAYED DURING UNSAT TRANSPORT	0.0000E+00

>>> EXPOSURE DATA FOR LIMITING SOIL CONCENTRATION

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INTEGRATION TIME (years)	30
BODY WEIGHT (kg)	7.000E+01
AVERAGING TIME (days)	2.550E+04
WATER INTAKE RATE (L/d)	2.000E+00
EXPOSURE FREQUENCY (days/year)	3.500E+02
EXPOSURE DURATION (years)	3.000E+01
RADIOLOGICAL DOSE LIMIT (rem/y)	4.000E-03
CARCINOGENIC RISK CRITERIA	1.000E-04
HAZARD QUOTIENT	1.000E+00

>>> RESULTS OF CALCULATIONS

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MAXIMUM RADIONUCLIDE CONCENTRATION LIMIT CALCULATION

LIMITING PARENT GW CONCENTRATION ADJUSTED FOR PROGENY = 6.00E-03 Ci/L

MAXIMUM GW CONCENTRATION FOR MBR #1: 1.77E-17 Ci/L

AVERAGE GW CONCENTRATION FOR MBR #1: 2.05E-17 Ci/L

PEAK TIME (y): 1.345467E+02

LIMITING SOIL CONCENTRATION (Ci/m\*\*3): 4.847E+05  
LIMITING SOIL CONCENTRATION (Ci/kg): 3.231E+02  
LIMITING INVENTORY IN SOIL (Ci): 4.455E+07  
LIMITING INVENTORY IN SOIL (mg): 1.245E+43  
SPECIFIC ACTIVITY (Ci/g): 3.578E-33