Appendix A

GWSCREEN Input Files

INPUT FILE FOR PBF-05 Co-60

```
PBF-05 Co-60
           1           0
 30.  0
  1.690E+01  1.690E+01  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  6.000E+01  0.000E+00
  1.500E+00  6.000E+01
  5.270E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  6.000E+01  1.000E+06
  1.900E+00  1.000E-01  1.000E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  2  2
  6.870E-04  4.000E+00  6.836E+03  4.870E-01  0.000E+00  2.490E+01
  1.890E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  8.460E+00  0.000E+00  0.000E+00
  7.00E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  4.000E-03  1.000E-07  1.000E-01
  2  6 12  5.000E-03
  3
  1.000E-02  1.040E+02  2.000E+00
  1.060E+02  1.360E+02  1.000E+00
  1.400E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-05 Cs-137

```
PBF-05 Cs-137
           1           0
 30.  0
  1.690E+01  1.690E+01  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  2.800E+02  0.000E+00
  1.500E+00  2.800E+02
  3.030E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  1.370E+02  1.000E+06
  1.900E+00  1.000E-01  5.000E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  2  2
  5.030E-02  6.000E+00  6.836E+03  4.870E-01  0.000E+00  2.490E+01
  3.160E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  8.460E+00  0.000E+00  0.000E+00
  7.00E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  4.000E-03  1.000E-07  1.000E-01
  2  6 12  5.000E-03
  3
  1.000E-02  1.040E+02  2.000E+00
  1.060E+02  1.360E+02  1.000E+00
  1.400E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-05 H-3

```
PBF-05 H-3
           1           0
 30.  0
  1.690E+01  1.690E+01  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  0.000E+00  0.000E+00
  1.500E+00  0.000E+00
  1.230E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  3.000E+00  1.000E+06
  1.900E+00  1.000E-01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  2  2
  3.000E-03  7.000E+00  6.836E+03  4.870E-01  0.000E+00  2.490E+01
  7.150E-02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  8.460E+00  0.000E+00  0.000E+00
  7.00E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  4.000E-03 1.000E-07  1.000E-01
  2  6 12  5.000E-03
  3
  1.000E-02  1.040E+02  2.000E+00
  1.060E+02  1.360E+02  1.000E+00
  1.400E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-05 Sr-90

```
PBF-05 Sr-90
          1          0
 30.  0
  1.690E+01  1.690E+01  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  1.500E+01  0.000E+00
  1.500E+00  1.500E+01
  2.910E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  9.000E+01  1.000E+06
  1.900E+00  1.000E-01  2.400E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  2  2
  3.010E-04  6.000E+00  6.836E+03  4.870E-01  0.000E+00  2.490E+01
  5.590E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  8.460E+00  0.000E+00  0.000E+00
  7.00E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  4.000E-03 1.000E-07  1.000E-01
  2  6 12  5.000E-03
  3
  1.000E-01  1.040E+02  2.000E+00
  1.060E+02  1.360E+02  1.000E+00
  1.400E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-15 Cr-III

```
PBF-15 Cr-III
          1          0
 30.  0
  8.502E+00  8.502E+00  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  7.000E+01  0.000E+00
  1.500E+00  7.000E+01
  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  5.199E+01  1.000E+06
  1.900E+00  1.000E-01  1.200E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  6  2
  3.768E+04  8.000E+00  1.728E+03  4.870E-01  0.000E+00  1.052E+01
  1.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  4.250E+00  0.000E+00  0.000E+00
  7.00E+01   1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
  2  6 12    5.000E-03
  3
  1.000E-02  1.080E+02  2.000E+00
  1.100E+02  1.400E+02  1.000E+00
  1.500E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-15 Hydrazine

```
PBF-15 Hydrazine
          1          0
 30.  0
  8.502E+00  8.502E+00  1.000E+00
  1.000E-01  3.430E-01  4.870E-01
  1.500E+00  3.000E-04  0.000E+00
  1.500E+00  3.000E-04
  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  0.000E+00  3.200E+01  1.000E+06
  1.900E+00  1.000E-01  3.000E-04  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  5  2
  1.000E+03  1.000E+00  1.728E+03  4.870E-01  0.000E+00  1.052E+01
  3.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  4.250E+00  0.000E+00  0.000E+00
  7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
  2  6 12    5.000E-03
  4
  1.000E-01  1.900E+01  0.500E+00
  2.000E+01  1.080E+02  2.000E+00
  1.100E+02  1.400E+02  1.000E+00
  1.500E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-15 Zinc

```
PBF-15 Zinc
          1           0
30.  0
 8.502E+00  8.502E+00  1.000E+00
 1.000E-01  3.430E-01  4.870E-01
 1.500E+00  2.000E+02  0.000E+00
 1.500E+00  2.000E+02
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 0.000E+00  6.539E+01  1.000E+06
 1.900E+00  1.000E-01  1.600E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  2
 6.330E+03  3.000E+00  1.728E+03  4.870E-01  0.000E+00  1.052E+01
 3.000E-01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 4.250E+00  0.000E+00  0.000E+00
 7.000E+01  1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-02  1.080E+02  2.000E+00
 1.100E+02  1.400E+02  1.000E+00
 1.500E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Ag

```
PBF-22 Ag
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  9.000E+01  0.000E+00
 1.500E+00  9.000E+01
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 1.659E+07  1.078E+02  1.000E+06
 1.900E+00  1.000E-01  9.000E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  1
 0.000E+00  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 5.000E-03  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Arochlor-1248

```
PBF-22 Arochlor-1248
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  1.000E+02  0.000E+00
 1.500E+00  1.000E+02
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 4.577E+05  3.720E+02  1.000E+06
 1.900E+00  1.000E-01  1.000E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  1
 0.000E+03  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 2.000E-05  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 4
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  9.000E+02  1.000E+01
 1.000E+03  5.000E+04  1.000E+03
```

INPUT FILE FOR PBF-22 Arochlor-1254

```
PBF-22 Arochlor-1254
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  1.000E+02  0.000E+00
 1.500E+00  1.000E+02
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 1.488E+07  3.720E+02  1.000E+06
 1.900E+00  1.000E-01  1.000E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  1
 0.000E+03  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 2.000E-05  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 4
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  9.000E+02  1.000E+01
 1.000E+03  5.000E+04  1.000E+03
```

INPUT FILE FOR PBF-22 Am-241

```
PBF-22 Am-241
          1           3
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  1.900E+03  0.000E+00
 1.500E+00  1.900E+03
 4.320E+02  2.140E+06  1.590E+05  7.340E+03  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 5.721E-04  2.410E+02  1.000E+06
 1.900E+00  1.000E-01  3.400E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E-04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
 3.280E+02  2.950E+02  4.480E+01  3.650E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Co-60

```
PBF-22 Co-60
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  6.000E+01  0.000E+00
 1.500E+00  6.000E+01
 5.270E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 4.291E-02  6.000E+01  1.000E+06
 1.900E+00  1.000E-01  1.000E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E-04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 1.890E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Cr-III

```
PBF-22 Cr-III
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  7.000E+01  0.000E+00
 1.500E+00  7.000E+01
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 2.803E+09  5.199E+01  1.000E+06
 1.900E+00  1.000E-01  1.200E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  1
 0.000E+04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 1.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.00E+01   1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Cs-137

```
PBF-22 Cs-137
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  2.800E+02  0.000E+00
 1.500E+00  2.800E+02
 3.030E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 2.117E-01  1.370E+02  1.000E+06
 1.900E+00  1.000E-01  5.000E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E-00  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
 3.160E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Hg

```
PBF-22 Hg
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  1.000E+02  0.000E+00
 1.500E+00  1.000E+02
 0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 2.098E+06  2.009E+02  1.000E+06
 1.900E+00  1.000E-01  1.000E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 6  1
 0.000E+03  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+01
 3.000E-04  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.000E+01  1.095E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-02  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 Pu-239

```
PBF-22 Pu-239
          1           3
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  5.500E+02  0.000E+00
 1.500E+00  5.500E+02
 2.410E+04  7.040E+08  3.730E+04  2.180E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.814E-04  2.390E+02  1.000E+06
 1.900E+00  1.000E-01  2.200E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E-04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
 3.160E+02  4.520E+01  1.490E+02  3.520E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-01  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+10
```

INPUT FILE FOR PBF-22 Sr-90

```
PBF-22 Sr-90
          1           0
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  1.500E+01  0.000E+00
 1.500E+00  1.500E+01
 2.910E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 1.029E-01  9.000E+01  1.000E+06
 1.900E+00  1.000E-01  2.400E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E-04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
 5.590E+01  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-02  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

INPUT FILE FOR PBF-22 U-234

```
PBF-22 U-234
          1           2
30.  0
 6.510E+01  6.510E+01  3.000E+00
 1.000E-01  3.430E-01  3.430E-01
 1.500E+00  3.500E+01  0.000E+00
 1.500E+00  3.500E+01
 2.450E+05  7.700E+04  1.600E+03  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 5.435E-02  2.340E+02  1.000E+06
 1.900E+00  1.000E-01  6.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 9.000E+00  4.000E+00  4.000E-01  5.700E+02
 1.500E+01  1.036E+01
 2  1
 0.000E+00  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
 4.440E+01  3.750E+01  2.950E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
 3.255E+01  0.000E+00  0.000E+00
 7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
 2  6 12    5.000E-03
 3
 1.000E-02  9.600E+01  2.000E+00
 9.800E+01  1.280E+02  1.000E+00
 1.300E+02  1.000E+03  1.000E+01
```

```
INPUT FILE FOR PBF-22 U-238
 PBF-22 U-238
           1           3
 30.  0
  6.510E+01  6.510E+01  3.000E+00
  1.000E-01  3.430E-01  3.430E-01
  1.500E+00  3.500E+01  0.000E+00
  1.500E+00  3.500E+01
  4.470E+09  2.450E+05  7.700E+04  1.600E+03  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  2.289E-02  2.380E+02  1.000E+06
  1.900E+00  1.000E-01  6.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  9.000E+00  4.000E+00  4.000E-01  5.700E+02
  1.500E+01  1.036E+01
  2  1
  0.000E-04  0.000E+00  0.000E+03  0.000E-01  0.000E+00  0.000E+00
  4.270E+01  4.440E+01  3.750E+01  2.950E+02  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
  3.255E+01  0.000E+00  0.000E+00
  7.00E+01   2.556E+04  2.000E+00  3.500E+02  3.000E+01  1.000E-06  1.000E-07  1.000E-01
  2  6 12    5.000E-03
  3
  1.000E-02  9.600E+01  2.000E+00
  9.800E+01  1.280E+02  1.000E+00
  1.300E+02  1.000E+03  1.000E+01
```

Appendix B

GWSCREEN Input File Description Sheets

PBF-05 (Cs-137)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-05 Cs-137		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Cs-137
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	16.9	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (286m2)^0.5=16.9m
	16.9	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(6836m3/yr)/(23.9m/yr)=286m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	280	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	280	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport contr
8/	30.3	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	137	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	500	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for Radioactive carcinogenic risk
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	0.0503	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from RWMIS and other data sources for this COC (=Total Quantity/TOPER)
	6	yr	TOPER	Operation time of facility	From RWMIS and other disposal records (= total years this COC was disposed at site)
	6836	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	24.9	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(6386+570(0.1)(16.9)(15))/(570(0.1)(15
15/	31.6	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	8.46	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02	2.000E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02	3.000E+02 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02	5.000E+02 5.000E+00	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-05 (H-3)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-05 H-3		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for H-3
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	16.9	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (286m2)^0.5=16.9m
	16.9	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(6836m3/yr)/(23.9m/yr)=286m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.)
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	0	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	0	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	12.3	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	3	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	0	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for Radioactive carcinogenic risk
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	0.003	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from RWMIS and other data sources for this COC (=Total Quantity/TOPER)
	7	yr	TOPER	Operation time of facility	From RWMIS and other disposal records (= total years this COC was disposed at site)
	6836	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	24.9	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(6386+570(0.1)(16.9)(15))/(570(0.1)(15))
15/	0.0715	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	8.46	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02	2.000E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02	3.000E+02 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02	5.000E+02 5.000E+00	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-05 (Sr-90)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-05 Sr-90		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Sr-90 (SF includes short-lived daughter Y-90)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	16.9	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (286m2)^0.5=16.9m
	16.9	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(6836m3/yr)/(23.9m/yr)=286m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.)
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	15	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	1.5 g/cm3 = representative value for INEL sedimentary beds
	15	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	29.1	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	90	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	24	mL/g	AKD	Sorption coefficient of contaminant in saturated zone	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	Assumed value (best estimate)
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for Radioactive carcinogenic risk
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	0.000301	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from RWMIS and other data sources for this COC (=Total Quantity/TOPER)
	6	yr	TOPER	Operation time of facility	From RWMIS and other disposal records (= total years this COC was disposed at site)
	6836	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	24.9	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(6386+570(0.1)(16.9)(15))/(570(0.1)(15))
15/	55.9	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	8.46	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02	2.000E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02	3.000E+02 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02	5.000E+02 5.000E+00	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-15 (Cr-III)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-15 Cr-III		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Cr-III
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	8.502	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (72.3m2)^0.5=8.502m
	8.502	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(1727.5m3/yr)/(23.9m/yr)=72.28m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.)
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	70	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	1.5 g/cm3 is representative value for INEL sedimentary interbeds
	70	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	0	yr	ATHALF	Half-life of contaminant	Radiologically stable element (GWSCREEN defaults to 1e+38)
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	51.99	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	1.2	mL/g	AKD	Sorption coefficient of contaminant in saturated zone	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	Assumed value (best estimate)
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	37680	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from INWMIS and other data sources for this COC (=Total Quantity/TOPER)
	8	yr	TOPER	Operation time of facility	From INWMIS and other disposal records (= total years this COC was disposed at site)
	1728	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	10.52	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(1727.5+570(0.1)(8.5)(15))/(570(0.1)(15))
15/	1	mg/kg/d	RFD	Reference dose	1990 HEAST
16/	4.25	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02	2.000E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02	3.000E+02 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02	5.000E+02 5.000E+00	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-15 (hydrazine)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-15 Hydrazine		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for hydrazine
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	8.502	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (72.3m2)^0.5=8.502m
	8.502	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(1727.5m3/yr)/(23.9m/yr)=72.28m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.)
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	0.0003	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	0.0003	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	0	yr	ATHALF	Half-life of contaminant	Radiologically stable element (GWSCREEN defaults to 1e+38)
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	32	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	0.0003	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	5		IMODE	Type of groundwater criteria	5 for Non-radiological carcinogenic risk
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	1000	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from INWMIS and other data sources for this COC (=Total Quantity/TOPER)
	1	yr	TOPER	Operation time of facility	Conservative best-guess estimate
	1728	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	10.52	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(1727.5+570(0.1)(8.5)(15))/(570(0.1)(15))
15/	3	1/(mg/kg/d)	SF	Carcinogenic risk slope factor	IRIS, 1996
16/	4.25	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-15 (zinc)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-15 Zinc		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Zn (non-rad)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	8.502	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (72.3m2)^0.5=8.502m
	8.502	m	WA	Width of source perpendicular to gw flow direction	The source area was calculated as = (Pond Flux)/(Ksat)=(1727.5m3/yr)/(23.9m/yr)=72.28m2
	1	m	THICKS	Thickness of source volume	Best guess estimate = 1m (simplification)
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.487	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Represents effective porosity (i.e., fully saturated) of interbed sediments (i.e., advective transp.)
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	200	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	200	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	0	yr	ATHALF	Half-life of contaminant	Radiologically stable element (GWSCREEN defaults to 1e+38)
9/	0	Ci or mg	QI	Initial contaminant inventory in source	Assumes modeling injection from start of well operations (i.e., no pre-existing contamination)
	65.39	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	16	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	2		IMODEL	Source model type	2 for "pond" release model (i.e., allows for injection well disposal water flux)
14/	6330	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Calculated from INWMIS and other data sources for this COC (=Total Quantity/TOPER)
	3	yr	TOPER	Operation time of facility	Conservative best-guess estimate
	1728	m3/yr	PNDFLX	Facility water flux to source	Annual average discharge rate to disposal well. Taken from INWMIS records.
	0.487	m3/m3	THETAP	Volumetric water content of pond sediments	Assumed saturated. Value represents porosity of interbed sediment
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	Assumed no evaporatioon or other significant loss mechanisms present
	10.52	m	WAEFF	Effective width of pond at aquifer	= (PNDFLX+(VX)(PHI)(AL)(THICK))/((VX)(PHI)(THICK)=(1727.5+570(0.1)(8.5)(15))/(570(0.1)(15))
15/	0.3	mg/kg/d	RFD	Reference dose	Nov.95 HEAST Supplement table value
16/	4.25	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02	2.000E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02	3.000E+02 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02	5.000E+02 5.000E+00	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Ag)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Ag		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Ag
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	90	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	90	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	0	yr	ATHALF	Half-life of contaminant	COC-specific
9/	1.7E+07	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	107.8	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	90	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	0.005	mg/kg/d	RFD	Reference dose	Nov.95 HEAST Supplement table value
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rul	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-01	9.600E+01 2.000E+00	T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01	1.280E+02 1.000E+00	T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02	1.000E+03 1.000E+01	T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Am-241)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Am-241		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	3		NPROG	Number of rad progeny	3 for Am-241 (Np-237, U-233, Th-229)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	1900	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	1900	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	432	yr	ATHALF	Half-life of contaminant	COC-specific (Am-241)
	2140000	yr	ATHALF	Half-life of contaminant	COC-specific (Np-237)
	159000	yr	ATHALF	Half-life of contaminant	COC-specific (U-233)
	7340	yr	ATHALF	Half-life of contaminant	COC-specific (Th-229)
9/	0.000572	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC)
	241	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	340	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	328	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Am-241)
	295	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Np-237)
	44.8	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (U-233)
	365	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Th-229)
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-01 9.600E+01 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01 1.280E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02 1.000E+03 1.000E+01		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Arochlor-1248)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Arochlor 1248		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Arochlor-1248
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	100	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	100	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	0	yr	ATHALF	Half-life of contaminant	COC-specific
9/	457700	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	372	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	10	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	2E-05	mg/kg/d	RFD	Reference dose	IRIS, 1996 (used value from Arochlor-1254)
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	4		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-01 9.600E+01 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01 1.280E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02 9.000E+02 1.000E+01		T1, T2, TP	Start, Stop, Print times for time period3	----------
	1.000E+03 5.000E+04 1.000E+03		T1, T2, TP	Start, Stop, Print times for time period3	

PBF-22
(arochlor-1254)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Arochlor 1254		TITLE	Project title	----------
2/	0		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Arochlor-1254 (non-rad)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	100	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	100	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds = vertical transport control
8/	0	yr	ATHALF	Half-life of contaminant	Radiologically stable element (GWSCREEN defaults to 1e+38)
9/	14880000	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC)
	372	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	10	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	0	mg/kg/d	RFD	Reference dose	IRIS, 1996
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Co-60)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Co-60		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Co-60
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	60	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	60	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	5.27	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0.04291	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	60	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	10	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	18.9	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Cr-III)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Cr-III		TITLE	Project title	----------
2/	0		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Cr-III
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	70	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value (1.9 g/cm3)
	70	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	0	yr	ATHALF	Half-life of contaminant	COC-specific
9/	2.8E+09	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	51.99	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	1.2	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	1	mg/kg/d	RFD	Reference dose	Nov.90 HEAST Supplement table value
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Cs-137)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Cs-137		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Cs-137
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	280	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value (1.9 g/cm3)
	280	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	30.3	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0.2117	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	137	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	500	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	31.6	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (mercury)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Hg		TITLE	Project title	----------
2/	0		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Hg
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	100	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	INEL Track 1 default value
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	100	mL/g	ZKDU	Sorption coefficient unsaturated zone	INEL Track 1 default value
8/	0	yr	ATHALF	Half-life of contaminant	COC-specific
9/	2098000	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	200.9	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	100	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	INEL Track 1 default value
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	6		IMODE	Type of groundwater criteria	6 for noncarcinogenic reference dose
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	0.0003	mg/kg/d	RFD	Reference dose	Nov.94 HEAST
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	10950	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Pu-239)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Pu-239		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	3		NPROG	Number of rad progeny	3 for Pu-239 (U-235, Pa-231, Ac-227)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	550	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	550	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	24100	yr	ATHALF	Half-life of contaminant	COC-specific (Pu-239)
	7E+08	yr	ATHALF	Half-life of contaminant	COC-specific (U-235)
	37300	yr	ATHALF	Half-life of contaminant	COC-specific (Pa-231)
	21.8	yr	ATHALF	Half-life of contaminant	COC-specific (U-237)
9/	0.000381	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	239	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	22	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	316	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Pu-239)
	45.2	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (U-235)
	149	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Pa-231)
	352	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Ac-227)
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-01 9.600E+01 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01 1.280E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02 1.000E+03 1.000E+10		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (Sr-90)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 Sr-90		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	0		NPROG	Number of rad progeny	0 for Sr-90
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	15	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	15	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	29.1	yr	ATHALF	Half-life of contaminant	COC-specific
9/	0.1029	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	90	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	24	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/y	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	55.9	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E+02 2.000E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	2.020E+02 3.000E+02 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	3.050E+02 5.000E+02 5.000E+00		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (U-234)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 U-234		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	2		NPROG	Number of rad progeny	2 for U-234 (Th-230, Ra-226)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source areaa 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	35	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	35	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	245000	yr	ATHALF	Half-life of contaminant	COC-specific (U-234)
	77000	yr	ATHALF	Half-life of contaminant	COC-specific (Th-230)
	1600	yr	ATHALF	Half-life of contaminant	COC-specific (Ra-226)
9/	0.05435	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	234	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	6	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mbing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	44.4	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (U-234)
	37.5	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Th-230)
	295	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Ra-226)
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-02 9.600E+01 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01 1.280E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02 1.000E+03 1.000E+01		T1, T2, TP	Start, Stop, Print times for time period3	----------

PBF-22 (U-238)

LINE	VALUE	UNITS	PARAMETER	DESCRIPTION	JUSTIFICATION FOR VALUE SELECTED
1/	PBF-22 U-238		TITLE	Project title	----------
2/	1		KFLAG	Calculation type	1 to calculate peak gw concentration and limiting soil concentration
	3		NPROG	Number of rad progeny	3 for U-238 (U-234, Th-230, Ra-226)
3/	30	yr	INTIME	Integration time for calculating average gw concentration	INEL Track 2 default value
	0		ITYPE	Type of groundwater solution	0 for 2-D vertically averaged solution
4/	65.1	m	AL	Length of source parallel to gw flow direction	Length and width were taken as the square root of source area, i.e., (4238m2)^0.5=65.1m
	65.1	m	WA	Width of source perpendicular to gw flow direction	Source area 4238 m2 estimated from S&A Plan grid (Hardy & Stanisich, 1989)
	3	m	THICKS	Thickness of source volume	Average surficial sediment thickness at PBF-22
5/	0.1	m/yr	PERC	Net percolation rate	0.1 m/yr = INEL Track 2 Default Value for "current" conditions
	0.343	m3/m3	THETAS	Vol. moisture content in contaminated (source) zone	van Genuchten moisture content - elevation relation for "current" background infiltration rate
	0.343	m3/m3	THETAU	Vol. moisture content in unsaturated zone	Same as used for THETAS
6/	1.5	g/cm3	RHOS	Bulk density contaminated (source) zone	INEL Track 2 default value
	35	mL/g	ZKDS	Sorption coefficient contaminated (source) zone	Value for sand (from DOE/ID-10389, Table F-1). Assumes source located in interbed
	0	1/yr	RC2	Rate constant for other loss mechanisms	Assumed no other significant loss mechanisms present
7/	1.5	g/cm3	RHOU	Bulk density unsaturated zone	INEL Track 2 Default value
	35	mL/g	ZKDU	Sorption coefficient unsaturated zone	Value for sand (from DOE/ID-10389, Table F-1). Considers interbeds=vert. transp. control
8/	4.5E+09	yr	ATHALF	Half-life of contaminant	COC-specific (U-238)
	245000	yr	ATHALF	Half-life of contaminant	COC-specific (U-234)
	77000	yr	ATHALF	Half-life of contaminant	COC-specific (Th-230)
	1600	yr	ATHALF	Half-life of contaminant	COC-specific (Ra-226)
9/	0.02289	Ci or mg	QI	Initial contaminant inventory in source	From sampling data: = sampled conc'n * (source area * depth); (assumed uniform dist. of COC
	238	g/mole	ZMW	Molecular weight of contaminant	COC-specific
	1000000	mg/L	SL	Solubility limit of contaminant	Set to 1E+6 to avoid solubility limitation (allows all contaminant to be soluble in water)
10/	1.9	g/cm3	RHOA	Bulk density of saturated (aquifer) zone	INEL Track 2 default value
	0.1	m3/m3	PHI	Porosity of saturated zone	INEL Track 2 default value
	6	mL/g	AKD	Sorption coefficient of contaminant in saturated (aquifer)	Value is "Suggested Track 1" for basalt (from DOE/ID-10389, Table F-1)
11/	9	m	AX	Longitudinal dispersivity	INEL Track 2 default value
	4	m	AY	Transverse dispersivity	INEL Track 2 default value
	0.4	m	AZ	Vertical dispersivity	INEL Track 2 default value
	570	m/yr	VX	Saturated pore velocity	INEL Track 2 default value
12/	15	m	THICK	Well screen (mixing) thickness	INEL Track 2 default value
	10.36	m	DEPTH	Unsaturated zone thickness	Average sum of interbed thicknesses of wells in PBF vicinity
13/	2		IMODE	Type of groundwater criteria	2 for radiological carcinogenic risk
	1		IMODEL	Source model type	1 for "buried source" release model (i.e., no data on disposal water flux)
14/	0	Ci/yr or mg/yr	RMI	Rate of contaminant mass input	Assumes no additional waste after initial emplacement; therefore not used
	0	yr	TOPER	Operation time of facility	" " "
	0	m3/yr	PNDFLX	Facility water flux to source	" " "
	0	m3/m3	THETAP	Volumetric water content of pond sediments	" " "
	0	1/yr	EVAP	Evaporation or other loss rate constant for pond	" " "
	0	m	WAEFF	Effective width of pond at aquifer	" " "
15/	42.7	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (U-238)
	44.4	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (U-234)
	37.5	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Th-230)
	295	risk/Ci	SF	Carcinogenic risk slope factor	Nov.95 HEAST Supplement table value (Ra-226)
16/	32.55	m	XD	Receptor distance from source center, parallel to gw flow	INEL Track 2 default value = 0.5(AL)
	0	m	YD	Receptor distance from source center, perpendicular to gw flow	INEL Track 2 default value
	0	m	ZD	Receptor distance from surface of aquifer	INEL Track 2 default value
17/	70	kg	BW	Body weight standard man	INEL Track 2 default value
	25560	d	AT	Averaging time	INEL Track 2 default value
	2	L/d	WI	Water intake rate	INEL Track 2 default value
	350	d/yr	EF	Exposure frequency	INEL Track 2 default value
	30	yr	ED	Exposure duration	INEL Track 2 default value
	0.004	rem/yr	DLIM	Radiological CEDE limit	INEL Track 2 default value
	1E-07		CRISK	Acceptable carcinogenic risk factor	INEL Track 2 default value
	0.1		HQ	Hazard quotient	INEL Track 2 default value
18/	2		ISOLVE	Numerical integration method type	2 for Simpson Rule integration
	6		JSTART	Number of iterations before checking convergence (Simpson rule)	----------
	12		JMAX	Max. number of iterations in Simpson rule integration	----------
	0.005		EPS	Convergence criteria for Simpson rule integration	----------
19/	3		NTIMES	Number of time periods to calculate concentration over	----------
	1.000E-02 9.600E+01 2.000E+00		T1, T2, TP	Start, Stop, Print times for time period1	----------
	9.800E+01 1.280E+02 1.000E+00		T1, T2, TP	Start, Stop, Print times for time period2	----------
	1.300E+02 1.000E+03 1.000E+01		T1, T2, TP	Start, Stop, Print times for time period3	----------