

APPENDIX F: OUTPUT ASCII FILE FROM PRE_CUTTINGS

This appendix lists the ASCII data file that results from exercising PRE_CUTTINGS. It is controlled under CMS and must be used exactly as it appears. Other output files are possible, but they too are recorded and controlled under the CMS and it is clear which results derive from which output ASCII files.

MODEL_DATA

```

!
!
!   The following input variables are hard wired and related to the Repository model
!   J. W. Berglund paper: Appendix A, CUTTING_S User's Manual, Ver 5.03
!
! PR_MAX  <>The maximum pressure allowed by model
PR_MAX   15.0E6
!
! PR_MIN  <>The minimum pressure allowed by model
PR_MIN   0.0E0
!
! PE_MAX  <>The maximum permeability allowed by model
PE_MAX   1.0E-12
!
! PE_MIN  <>The minimum permeability allowed by model
PE_MIN   1.0E-17
!
! PCUT    <> Pressure (Pa) which defines the border between the
!          erosion phase and the blowout phase
PCUT     8.0E6
!
! PGAS    <> Pressure (Pa) which defines the border between the gas
!          erosion phase and the stuck pipe phase
PGAS     10.0E6
!
! KCRIT   <> Permeability which defines the phase border between the blowout
!          phase and the gas erosion/stuck pipe phase
KCRIT    1.0E-16
!
!
! Properties relative to the model (repository) <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
!
! DELTR   <> Delta radius for derivative in stress calculation
DELTR    0.00001
!
! ITER    <> Number of iterations to solve for Reynolds number
ITER     1
!
! FGE     <> Gravity effectiveness factor
FGE      18.4
!
! FSE     <> Strength effectiveness factor
FSE      0.0
!
! FCE     <> Cementation effectiveness factor
FCE      0.0
!
! CEMENT  <> Cementation stress
CEMENT   0.0
!
! SUFTEN  <> Surface tension (N/N)
SUFTEN   8.0E-2

```


!
! ! END_OF_MODEL_INPUT

RADIONUCLIDE_DATA

!GEOMETRY

INV_AR 1.11520E+05
RHW_AR 1.11520E+05
WUF 5.25

!MATERIAL

OUT_MAT BOREHOLE

!REPOSITORY_TYPE

REP_NAME WIPP
REP_GEOLOGY HALITE

RADWASTE_type Contact_handled

!RADIOISOTOPE_chains

!
! chain1/chain2 from U234 & down are the same:
! (Both chains are input)

!	\\	\\	\\	\\	\\	\\	\\
CHAIN1	PU242	U238	TH234	PA234M	U234	TH230	RA226
	RN222	PO218	PB214	BI214	PO214	PB210	<
CHAIN2	PU238	U234	TH230	RA226	RN222	PO218	
	PB214	BI214	PO214	PB210	<		

! chain3/chain4 from PU239 & down are the same:

CHAIN3	AM243	NP239	PU239	U235	TH231	PA231	AC227
	TH227	RA223	RN219	PO215	PB211	BI211	TL207 <
CHAIN4	CM243	PU239	U235	TH231	PA231	AC227	TH227
	RA223	RN219	PO215	PB211	BI211	TL207	<

! chain5/chain6 from U236 & down are the same:

CHAIN5	CF252	CM248	PU244	PU240	U236	TH232	RA228
	AC228	TH228	RA224	RN220	PO216	PB212	BI212
	PO212	<					
CHAIN6	CM244	PU240	U236	TH232	RA228	AC228	TH228
	RA224	RN220	PO216	PB212	BI212	PO212	<

CHAIN7	CM245	PU241	AM241	NP237	PA233	U233	TH229
	RA225	AC225	FR221	AT217	BI213	PO213	PB209 <

CHAIN8 CS137 BA137M <

CHAIN9 PM147 SM147 ND143 <

CHAIN10 SR90 Y90 ZR90 <

! ^ ^ ^ ^ ^ ^ ^

SAVE	AM241	AM243	CF252	CM243	CM244	CM245	CM248	CS137
	NP237	PA231	PB210	PM147	PU238	PU239	PU240	PU241
	PU242	PU244	RA226	RA228	SR90	TH229	TH230	TH232
	U233	U234	U235	U236	U238	<		

TABULAR DATA

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!
! Example of how radioisotope data are entered:
!
! ...1st Line: Radionuclide (an asterisk in column 1 follow
!                               by radionuclide name, ex; *AC225 )
!
! ...2nd & 3rd line
!
! ...Field#1 Atomic Weight      (Kg/Mole) AWT      [REAL] (3(11x,1pe14.6))
! ...Field#2 Half-Life          (Years) HALFY      [REAL]
! ...Field#3 Activity Conversion (Ci/Kg) AWTCNV     [REAL]
! ...Field#4 EPA Release Limit  (Ci) EPAREL        [REAL]
! ...Field#5 Inventory          (Ci) INVCHD        [REAL]
! ...Field#6 Inventory          (Ci) INVRHD        [REAL]
!
!
!
!

```

```

! *PU241
!
! XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
! AWT      2.410000E-01 HALFY      1.439900E+01 ACTCNV      1.030000E+05
! EPAREL    1.000000E+07 INVCHD    1.930000E+06 INVRHD      0.000000E+00
!
!
!

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<TABLE_INPUTS

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*AC225
  AWT      2.250230E-01 HALFY      2.737909E-02 ACTCNV      5.802700E+07
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*AC227
  AWT      2.270280E-01 HALFY      2.177335E+01 ACTCNV      7.232300E+04
  EPAREL    1.000000E+02 INVCHD    0.000000E+00

*AC228
  AWT      2.280310E-01 HALFY      6.993710E-04 ACTCNV      2.241700E+09
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*AM241
  AWT      2.410570E-01 HALFY      4.322347E+02 ACTCNV      3.431200E+03
  EPAREL    1.000000E+02 INVCHD    2.400000E+05

*AM243
  AWT      2.430610E-01 HALFY      7.380313E+03 ACTCNV      1.992900E+02
  EPAREL    1.000000E+02 INVCHD    0.000000E+00

*AT217
  AWT      2.170050E-01 HALFY      1.023547E-09 ACTCNV      1.609500E+15
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*BA137M
  AWT      1.369070E-01 HALFY      4.851550E-06 ACTCNV      5.382400E+11
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*BI211
  AWT      2.109870E-01 HALFY      4.049824E-06 ACTCNV      4.184000E+11
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*BI212
  AWT      2.119910E-01 HALFY      1.151253E-04 ACTCNV      1.464800E+10
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*BI213
  AWT      2.129940E-01 HALFY      8.679553E-05 ACTCNV      1.933800E+10
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*BI214
  AWT      2.139990E-01 HALFY      3.783638E-05 ACTCNV      4.415300E+10
  EPAREL    0.000000E+00 INVCHD    0.000000E+00

*CF252
  AWT      2.520820E-01 HALFY      2.638090E+00 ACTCNV      5.375899E+05
  EPAREL    0.000000E+00 INVCHD    2.960000E+03

*CM243
  AWT      2.430610E-01 HALFY      2.850088E+01 ACTCNV      5.160700E+04
  EPAREL    1.000000E+02 INVCHD    0.000000E+00

*CM244

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AWT	2.440630E-01	HALFY	1.811013E+01	ACTCNV	8.088299E+04
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*CM245					
AWT	2.450650E-01	HALFY	8.498927E+03	ACTCNV	1.716500E+02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*CM248					
AWT	2.480720E-01	HALFY	3.390698E+05	ACTCNV	4.250200E+00
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*CS137					
AWT	1.369070E-01	HALFY	2.999975E+01	ACTCNV	8.704300E+04
EPAREL	1.000000E+03	INVCHD	2.070000E+04		
*FR221					
AWT	2.210140E-01	HALFY	9.126364E-06	ACTCNV	1.772400E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*ND143					
AWT	1.430000E-01	HALFY	3.168876E+30	ACTCNV	0.000000E+00
EPAREL	1.000000E+03	INVCHD	0.000000E+00		
*NP237					
AWT	2.370480E-01	HALFY	2.139942E+06	ACTCNV	7.047600E-01
EPAREL	1.000000E+02	INVCHD	6.670000E+01		
*NP239					
AWT	2.390530E-01	HALFY	6.448664E-03	ACTCNV	2.319100E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PA231					
AWT	2.310360E-01	HALFY	3.276618E+04	ACTCNV	4.722500E+01
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*PA233					
AWT	2.330400E-01	HALFY	7.392988E-02	ACTCNV	2.075100E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PA234M					
AWT	2.340430E-01	HALFY	2.224551E-06	ACTCNV	6.866600E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB209					
AWT	2.089810E-01	HALFY	3.764625E-04	ACTCNV	4.544100E+09
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB210					
AWT	2.099840E-01	HALFY	2.229938E+01	ACTCNV	7.634800E+04
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*PB211					
AWT	2.109890E-01	HALFY	6.863786E-05	ACTCNV	2.468600E+10
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB212					
AWT	2.119920E-01	HALFY	1.213680E-03	ACTCNV	1.389500E+09
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB214					
AWT	2.140000E-01	HALFY	5.095553E-05	ACTCNV	3.278500E+10
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PM147					
AWT	1.469150E-01	HALFY	2.623513E+00	ACTCNV	9.275300E+05
EPAREL	0.000000E+00	INVCHD	5.250000E+02		
*PO212					
AWT	2.119890E-01	HALFY	9.506629E-15	ACTCNV	1.773900E+20
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO213					
AWT	2.129930E-01	HALFY	1.330928E-13	ACTCNV	1.261100E+19
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO214					
AWT	2.139950E-01	HALFY	5.206464E-12	ACTCNV	3.208700E+17
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO215					
AWT	2.149990E-01	HALFY	5.640600E-11	ACTCNV	2.947900E+16
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO216					
AWT	2.160020E-01	HALFY	4.753314E-09	ACTCNV	3.482000E+14
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO218					
AWT	2.180090E-01	HALFY	5.799044E-06	ACTCNV	2.827800E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PU238					
AWT	2.380500E-01	HALFY	8.774619E+01	ACTCNV	1.711500E+04

EPAREL	1.000000E+02	INVCHD	4.240000E+06		
*PU239					
AWT	2.390520E-01	HALFY	2.406445E+04	ACTCNV	6.214600E+01
EPAREL	1.000000E+02	INVCHD	3.920000E+05		
*PU240					
AWT	2.400540E-01	HALFY	6.537392E+03	ACTCNV	2.278100E+02
EPAREL	1.000000E+02	INVCHD	6.930000E+04		
*PU241					
AWT	2.410570E-01	HALFY	1.439937E+01	ACTCNV	1.030000E+05
EPAREL	0.000000E+00	INVCHD	1.930000E+06		
*PU242					
AWT	2.420590E-01	HALFY	3.869198E+05	ACTCNV	3.817100E+00
EPAREL	1.000000E+02	INVCHD	4.910000E+04		
*PU244					
AWT	2.440640E-01	HALFY	8.261261E+07	ACTCNV	1.773100E-02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*RA223					
AWT	2.230190E-01	HALFY	3.130533E-02	ACTCNV	5.120600E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA224					
AWT	2.240200E-01	HALFY	1.001999E-02	ACTCNV	1.592700E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA225					
AWT	2.250240E-01	HALFY	4.052993E-02	ACTCNV	3.919900E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA226					
AWT	2.260250E-01	HALFY	1.599966E+03	ACTCNV	9.885801E+02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*RA228					
AWT	2.280310E-01	HALFY	6.699955E+00	ACTCNV	2.340000E+05
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN219					
AWT	2.190090E-01	HALFY	1.254875E-07	ACTCNV	1.300800E+13
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN220					
AWT	2.200110E-01	HALFY	1.761895E-06	ACTCNV	9.222600E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN222					
AWT	2.220180E-01	HALFY	1.046997E-02	ACTCNV	1.538000E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*SM147					
AWT	1.470000E-01	HALFY	1.059355E+11	ACTCNV	2.295400E-05
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*SR90					
AWT	8.990801E-02	HALFY	2.912197E+01	ACTCNV	1.365400E+05
EPAREL	1.000000E+03	INVCHD	9.850002E+03		
*TH227					
AWT	2.270280E-01	HALFY	5.124073E-02	ACTCNV	3.073200E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH228					
AWT	2.280290E-01	HALFY	1.913051E+00	ACTCNV	8.195301E+05
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH229					
AWT	2.290320E-01	HALFY	7.339118E+03	ACTCNV	2.126900E+02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*TH230					
AWT	2.300330E-01	HALFY	7.700370E+04	ACTCNV	2.018300E+01
EPAREL	1.000000E+01	INVCHD	0.000000E+00		
*TH231					
AWT	2.310360E-01	HALFY	2.911247E-03	ACTCNV	5.315200E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH232					
AWT	2.320380E-01	HALFY	1.405080E+10	ACTCNV	1.096500E-04
EPAREL	1.000000E+01	INVCHD	6.110000E-01		
*TH234					
AWT	2.340440E-01	HALFY	6.597601E-02	ACTCNV	2.315200E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TL207					
AWT	2.069770E-01	HALFY	9.069325E-06	ACTCNV	1.904500E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		

*U233					
AWT	2.330400E-01	HALFY	1.585072E+05	ACTCNV	9.678300E+00
EPAREL	1.000000E+02	INVCHD	1.310000E+03		
*U234					
AWT	2.340410E-01	HALFY	2.445105E+05	ACTCNV	6.247300E+00
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*U235					
AWT	2.350440E-01	HALFY	7.038074E+08	ACTCNV	2.161100E-03
EPAREL	1.000000E+02	INVCHD	1.150000E+00		
*U236					
AWT	2.360460E-01	HALFY	2.341483E+07	ACTCNV	6.468300E-02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*U238					
AWT	2.380510E-01	HALFY	4.468115E+09	ACTCNV	3.361100E-04
EPAREL	1.000000E+02	INVCHD	2.010000E-01		
*Y90					
AWT	8.990701E-02	HALFY	7.301091E-03	ACTCNV	5.446300E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*ZR90					
AWT	9.000000E-02	HALFY	3.168876E+30	ACTCNV	0.000000E+00
EPAREL	1.000000E+03	INVCHD	0.000000E+00		

END_TABLES>
!
! END_OF_RADIOISOTOPE_INPUT
!

END OF APPENDIX F