APPENDIX E: TEMPLATE INPUT DATA FILE FOR PRE_CUTTINGS

This file either (1) defines or (2) calls from the WIPP controlled database all data required to exercise CUTTINGS_S.

```
!!
!!  Template file for PRE_CUSP WIPP property database
!!

   MODEL_DATA
!!
!!  =wipp::my_database:calc_name
!!
=wipp::wipp_db:WIPP_CCA

!
!    The following input variables are hard wired and are related to the
! repository-model paper by J. W. Berglund (see Appendix A)
!
! PR_MAX  <>The maximum pressure allowed by model
  PR_MAX            15.0E6

! PR_MIN  <>The minimum pressure allowed by model
  PR_MIN             0.0E6

! 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
!                    errosion phase and the bowout 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 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
  BLOWOUT:FGE

! FSE     <>  Strength effectiveness factor
  BLOWOUT:FSE

! FCE     <>  Cementation  effectiveness factor
  BLOWOUT:FCE

! CEMCEM  <>  Cementation stress
  BLOWOUT:CEMENT

! SUFTEN  <> Surface tension (N/N)
```

```
  BLOWOUT:SUFTEN


! Properties of the gas (Hydrogen) in the repository <<<<<<<<<<<<<<<<<<<<<<<<
!
! KGAS     <> Ratio of Specific Heats
  BLOWOUT:KGAS

! RGAS     <> Gas Constant for Hydrogen
  BLOWOUT:RGAS

! VISC     <> Hydrogen viscosity
  BLOWOUT:VISC

! PSUF     <> Surface presure (Pa)
  BLOWOUT:PSUF


! Properties to do with the repository <<<<<<<<<<<<<<<<<<<<<<<<
!
! TREPO    <> Temperature of repository (K)
  BLOWOUT:TREPO

! DEPTH    <> Distance from repository depth to depth where casing
!                     is set (m)
  BLOWOUT             716.0

! FLWCNST <> Percent volume of material that is carried by Drilling
!                       mud (unitless)
  FLWCNST              0.05

! HREPO    <> Height of repository at burial time       (4m)
  BLOWOUT:HREPO

! RPANEL   <> The equivalent radius of 1 panel     (910.0m**2)
  BLOWOUT:RPANEL

! ROOM     <> The equivalent radius of 1 room      (11,640m**2)
  BLOWOUT:ROOM

! RHOS     <> Waste particle density (kg/m**3)
  BLOWOUT:RHOS


! Variables to do with drilling <<<<<<<<<<<<<<<<<<<<<<<<
!
! L1       <> Collar Length (m)
  BOREHOLE:L1

! L2       <> Drill pipe length (m)
  BOREHOLE:L2

! COLDIA   <> Collar diameter (m)
  BOREHOLE:COLDIA

! PIPED    <> Drill pipe diameter (m)
  BOREHOLE:PIPED

! ROUGHP   <> Friction factor (unitless)
  BOREHOLE:ROUGHP

!
! APORO    <> A constant in equation to determine permeability as a
!                 function of porosity
  BLOWOUT:APORO

! NPORO    <> N constant in equation to determine permeability as a
!                 function of porosity
```

```
  BLOWOUT                0.0
!
! END_OF_MODEL_INPUT
!


   RADIONUCLIDE_DATA

!GEOMETRY

  BOREHOLE:INV_AR

  BOREHOLE:RHW_AR

  BOREHOLE:WUF

!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 required 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    PB209    <

!  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     <

 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

!
! Example of how radioisotope data are input:
!
!...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
!xxxaaaaaaaaeeeeeeeeeeeeeeexxxaaaaaaaaeeeeeeeeeeeeeexxxaaaaaaaaeeeeeeeeeeeee
!   AWT       2.410000E-01   HALFY     1.439900E+01   ACTCNV    1.030000E+05
!   EPAREL    1.000000E+07   INVCHD    1.930000E+06   INVRHD    0.000000E+00
!
!
<TABLE_INPUTS
<GENERATE_RADIO>
END_TABLES>
!
! END_OF_RADIOISOTOPE_INPUT
!
```

END OF APPENDIX E