APPENDIX D

PREDA (PREDA.FOR) PROGRAM FILE

PREDA (PREDA.FOR) Program File

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C     PROGRAM PREDA5X.FORT
C      PREPARES INPUT DATA FOR DARTAB CODE.
C      SEARCHES DOSE RATE-HEALTH RISK DATA SET FOR AVAILABLE NUCLIDES
C      AND ORGANS, FINDS CORRESPONDING NUCLIDES IN AIRDOS DATA SET.
C      THESE MATCHING NUCLIDES,ORGAN NAMES, AND REST OF DATA NECESSARY
C      FOR DARTAB INPUT ARE WRITTEN AS A TEMPORARY DATA SET ON DISK.
C     MODIFIED FOR SPECIAL CASE INHALATION VALUES OF F1. 11/28/83
C     REVISED AND CORRECTED.                             12/31/83
C    REVISED AND CORRECTED                               05/29/84
C
      REAL*8 NUCAIR,NUC,ORGN,CANC,ORGB,TOTBOD,
     > NUCOLD,RNLOC,OGLOC,GEN
      LOGICAL OUTPUT,GENEFF,EOF,PASS
      LOGICAL*1 NUCL1(8),NUCL(4),NUCL4,LBL
      EQUIVALENCE (NUCL1(1),NUC),(NUCL(1),NUCI),(NUCL(4),NUCL4)
      REAL LLET
      INTEGER PTLOC,FALOC,HLLOC,RTABLE,FTABLE,DTABLE,FIND
      DIMENSION TITLE(20),DTABLE(7),FTABLE(7),RTABLE(7),TIME(20),
     > HLET(20),LLET(20), RELABS(20),ORGN(20),CANC(20), ORGB(20),
     > OING(25),OINH(25),ORGDAT(20),IPATH(20),
     > NUCAIR(40),GI(4), GIABS(4,40),ILET(2), RNLOC(10),
     > OGLOC(10),PTLOC(10),FALOC(10),HLLOC(10), LTABLE(10),GEN(3),
     > GRFAC(2),GLLET(3),GHLET(3), FIND(40,13),RLIST(5),SSIZE(40),
     > SRESP(40),SGIABS(4,40), IFIND(13),PSIZN(40),RESPN(40),IRSP(4,4)
      DATA FIND/520*0/,IFIND/2,3,4,5,12,13,14,15,33,96,97,98,99/, RLIST/
     > 1HY,1HW,1HD,1H*,1H /,NUCOLD/8H        /,STAR/4H*   /
      DATA TOTBOD/8HT BODY  /,NUCI/0/,NBL1/Z40/,DLM1/2H '/,DLM2/2H',/
      DATA LBL/1H /,IRSP/1,2,3,4,2,1,3,4,3,2,1,4,4,3,2,1/,EOF/F/,PASS/T/
      NAMELIST/INPUT/ILOC,JLOC,PLOC,ILET,DTABLE,RTABLE,FTABLE,
     > OUTPUT,GSCFAC,ICRP,IHEAD
      NAMELIST/GENTIC/GENEFF,GEN,NGEN,GRFAC,REPPER,GLLET,GHLET
      NAMELIST/ORGAN/ORGN,NORGN,TIME
      NAMELIST/QFACTR/HLET,LLET
      NAMELIST/CANCER/CANC,NCANC,RELABS
      NAMELIST/LOCTBL/NTLOC,RNLOC,OGLOC,PTLOC,FALOC,HLLOC,LTABLE
      NAMELIST/ORGANF/NORGB,ORGB,ORGDAT,IPATH
C
C
C     READ TITLE,SET DEFAULT VALUES
C
      READ(5,10800) TITLE
      WRITE(6,10810) TITLE
      ILOC=0
      JLOC=0
      PLOC=100.
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      NORGN=0
      NCANC=1
      CANC(1)=TOTBOD
      DO 10 J=1,7
      DTABLE(J)=0
      RTABLE(J)=0
      FTABLE(J)=0
   10 CONTINUE
      RTABLE(6)=4
      GSCFAC=0.5
      ILET(1)=1
      ILET(2)=1
      ICRP=1
      IHEAD=1
      DO 20 J=1,20
      TIME(J)=70.
      HLET(J)=20.
      LLET(J)=1.
      RELABS(J)=1.
   20 CONTINUE
      NGEN=0
      GENEFF=.FALSE.
C
C     READ NAMELIST VARIABLES
C
   22 READ(5,INPUT,END=22)
      READ(5,ORGAN)
      READ(5,QFACTR)
      READ(5,CANCER)
      READ(5,GENTIC)
      READ(5,LOCTBL)
      READ(5,ORGANF)
C
C     READ AND SAVE NUCLIDE NAME  FROM AIRDOS DATA SET (UNIT 26)
C
      DO 90 I=1,1000
      READ(26,END=100) NUC,SIZE,RSP,GI,TIM,IND
      IF (I.LE.40) GO TO 30
      IF (I.EQ.41) WRITE(6,10000)
      WRITE(6,10100) NUC,SIZE,RSP,GI,IND
      GO TO 70
   30 M=I
      NUCL4=NUCL1(1)
      WRITE(6,10100) NUC,SIZE,RSP,GI,IND
      IF (NUCI.NE.NBL1) GO TO 50
      DO 40 J=1,7
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   40 NUCL1(J)=NUCL1(J+1)
      NUCL1(8)=LBL
   50 NUCAIR(M)=NUC
      PSIZN(M)=SIZE
      RESPN(M)=RSP
      IF(RESPN(M).EQ.STAR) PSIZN(M)=0.
      DO 60 J=1,4
   60 GIABS(J,M)=0.0
      IF(GI(1).GT.1.) GIABS(1,M)=GI(1)
      GIABS(2,M)=GI(2)
   70 READ(26) NOL,NOU,NRL,NRU
      DO 80 ILO=NOL,NOU
      DO 80 JLO=NRL,NRU
   80 READ(26)
      IF (IND.EQ.1) READ(26)
   90 CONTINUE
  100 MNUC=M
C
C     READ NUCLIDE NAMES,INFORMATION FROM DOSE RATE-HEALTH RISK
C     DATA SET (UNIT 25). SAVE THOSE WHICH CORRESPOND WITH AIRDOS
C     NUCLIDES.
C
  110 READ(25,END=112) NUC,SIZE,RSP,GI,TIM,IND
      GO TO 114
  112 EOF=.TRUE.
      GO TO 116
  114 IF(NUC.EQ.NUCOLD) GO TO 166
  116 IF(PASS) GO TO 160
      DO 150 M=1,MNUC
      IF(NUCOLD.NE.NUCAIR(M)) GO TO 150
C     CHECK INHALATION FACTOR RESPN
      DO 118 L=1,4
      IF(RESPN(M).EQ.RLIST(L)) GO TO 120
  118 CONTINUE
      L=1
  120 LM=L
C     FIND BEST MATCH FOR RESPN AND PSIZN IN RADRISK FILE
      IF(NFINH.EQ.0) GO TO 140
      PSIZE=9E9
      DO 124 L=1,4
      RESP=RLIST(IRSP(L,LM))
      DO 122 K=1,NFINH
      IF(SRESP(K).NE.RESP) GO TO 122
      IF(ABS(SSIZE(K)-PSIZN(M)).LT.ABS(PSIZE-PSIZN(M))) PSIZE=SSIZE(K)
  122 CONTINUE
      IF(PSIZE.NE.9E9) GO TO 126
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  124 CONTINUE
  126 IF(RESP.EQ.RESPN(M).AND.
     &   ABS(PSIZE-PSIZN(M)).LE.1E-2*PSIZN(M)) GO TO 128
      WRITE(6,10200) NUCAIR(M),PSIZN(M),PSIZE,RESPN(M),RESP
  128 RESPN(M)=RESP
      PSIZN(M)=PSIZE
C     FIND BEST MATCH FOR GIABS IN RADRISK FILE
  140 IF(NFING.EQ.0) GO TO 150
      GI2=9E9
      DO 142 K=1,NFING
      IF(ABS(SGIABS(2,K)-GIABS(2,M)).GE.ABS(GI2-GIABS(2,M))) GO TO 142
      KM=K
      GI2=SGIABS(2,K)
  142 CONTINUE
      IF(ABS(GI2-GIABS(2,M)).LT.1E-2*GIABS(2,M)) GO TO 144
      WRITE(6,10300) NUCAIR(M),(GIABS(I,M),I=1,4),
     &               GIABS(1,M),(SGIABS(I,KM),I=2,4)
  144 DO 146 I=2,4
  146 GIABS(I,M)=SGIABS(I,KM)
  150 CONTINUE
  160 IF(EOF) GO TO 430
C     OBTAIN INGESTION AND INHALATION PARAMETERS FOR NEXT NUCLIDE
      NUCOLD=NUC
      NFING=0
      NFINH=0
      PASS=.TRUE.
      DO 162 M=1,MNUC
      IF(NUC.EQ.NUCAIR(M)) GO TO 164
  162 CONTINUE
      GO TO 166
  164 PASS=.FALSE.
  166 READ(25)
      READ(25)
      IF(IND.LT.10.OR.IND.GE.90) GO TO 168
      READ(25)
      READ(25)
  168 IF(PASS) GO TO 110
      IF((IND.EQ.2.OR.IND.EQ.3).AND.ABS(TIM-70.).GE.0.7) GO TO 110
      IN=MOD(IND-1,10)+1
      IF (IND.GE.90) IN=11-IN
      GO TO (320,330,350,370,380),IN
  320 WRITE(6,10400) NUC,IND
      GO TO 420
C     INGESTION FACTORS
  330 IF(NFING.EQ.0) GO TO 334
      DO 332 I=1,NFING
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      IF(SGIABS(2,I).EQ.GI(2)) GO TO 390
  332 CONTINUE
  334 NFING=NFING+1
      DO 336 I=1,4
  336 SGIABS(I,NFING)=GI(I)
      GO TO 390
C     INHALATION FACTORS
  350 IF(NFINH.EQ.0) GO TO 354
      DO 352 I=1,NFINH
      IF(SRESP(I).EQ.RSP.AND.SSIZE(I).EQ.SIZE) GO TO 390
  352 CONTINUE
  354 NFINH=NFINH+1
      SRESP(NFINH)=RSP
      SSIZE(NFINH)=SIZE
      GO TO 390
C     AIR IMMERSION FACTORS
  370 GO TO 390
C     GROUND SURFACE FACTORS
  380 GO TO 390
C
  390 DO 400 J=1,13
      IF (IND.EQ.IFIND(J)) GO TO 410
  400 CONTINUE
      WRITE(6,10500) IND
  410 FIND(M,J)=FIND(M,J)+1
  420 GO TO 110
C
  430 WRITE(6,10600)
      DO 450 M=1,MNUC
      WRITE(6,10700) M,NUCAIR(M),RESPN(M),PSIZN(M),(GIABS(I,M),I=1,4),
     > (FIND(M,I),I=1,13)
  450 CONTINUE
C
      NONCLD=MNUC
C
C     WRITE ALL INPUT REQUIRED BY DARTAB ONTO SPDA (UNIT 30)
C
C     WRITE TITLE
C
      WRITE(30,10800) TITLE
      WRITE(6,10810) TITLE
C     WRITE INPUT INFORMATION TO BE READ BY DARTAB AS NAMELIST/INPUT/.
C
      WRITE(30,10900) ILOC,JLOC,PLOC,ILET,DTABLE,RTABLE,FTABLE,
     >  OUTPUT,GSCFAC,ICRP,IHEAD
      WRITE(6,10900) ILOC,JLOC,PLOC,ILET,DTABLE,RTABLE,FTABLE,
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     > OUTPUT,GSCFAC,ICRP,IHEAD
C     WRITE ORGAN INFORMATION TO BE READ BY DARTAB AS NAMELIST/ORGAN/.
C
      WRITE(30,11000) NORGN,(DLM1,ORGN(N),DLM2,N=1,NORGN)
      WRITE(6,11000) NORGN,(DLM1,ORGN(N),DLM2,N=1,NORGN)
      WRITE(30,11100) (TIME(N),N=1,NORGN)
      WRITE(6,11100) (TIME(N),N=1,NORGN)
      WRITE(30,11200)
      WRITE(6,11200)
C     WRITE DOSE EQUIVALENT FACTOR INFORMATION TO BE READ BY
C     DARTAB AS NAMELIST/QFACTR/.
C
      IF (ILET(1).EQ.0) GO TO 460
      WRITE(30,11210) HLET
      WRITE(6,11210) HLET
      WRITE(30,11220) LLET
      WRITE(6,11220) LLET
      WRITE(30,11200)
      WRITE(6,11200)
C     WRITE CANCER INFORMATION TO BE READ BY DARTAB AS NAMELIST/CANCER/.
C
  460 WRITE(30,11500) NCANC,(DLM1,CANC(N),DLM2,N=1,NCANC)
      WRITE(6,11500) NCANC,(DLM1,CANC(N),DLM2,N=1,NCANC)
      WRITE(30,11600) (RELABS(N),N=1,NCANC)
      WRITE(6,11600) (RELABS(N),N=1,NCANC)
      WRITE(30,11200)
      WRITE(6,11200)
      WRITE(30,11300) GENEFF,NGEN,(DLM1,GEN(I),DLM2,I=1,NGEN)
      WRITE(30,11400) GRFAC,REPPER,GLLET,GHLET
      WRITE(6,11300) GENEFF,NGEN,(DLM1,GEN(I),DLM2,I=1,NGEN)
      WRITE(6,11400) GRFAC,REPPER,GLLET,GHLET
      WRITE(30,11200)
      WRITE(6,11200)
C     WRITE NUCLIDE INFORMATION TO BE READ BY DARTAB AS NAMELIST/RNUCLD/
C
      WRITE(30,11700) NONCLD,(DLM1,NUCAIR(N),DLM2,N=1,NONCLD)
      WRITE(6,11700) NONCLD,(DLM1,NUCAIR(N),DLM2,N=1,NONCLD)
      WRITE(30,11800) (PSIZN(N),N=1,NONCLD)
      WRITE(6,11800) (PSIZN(N),N=1,NONCLD)
      WRITE(30,11900) (DLM1,RESPN(N),DLM2,N=1,NONCLD)
      WRITE(6,11900) (DLM1,RESPN(N),DLM2,N=1,NONCLD)
      WRITE(30,12000) ((GIABS(I,N),I=1,4),N=1,NONCLD)
      WRITE(6,12000) ((GIABS(I,N),I=1,4),N=1,NONCLD)
      WRITE(30,11200)
      WRITE(6,11200)
C     WRITE LOCATION TABLE INFORMATION TO BE READ BY DARTAB
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C      AS NAMELIST/LOCTBL/.
C
      WRITE(30,12100) NTLOC,(DLM1,RNLOC(N),DLM2,N=1,NTLOC)
      WRITE(6,12100) NTLOC,(DLM1,RNLOC(N),DLM2,N=1,NTLOC)
      WRITE(30,12200) (DLM1,OGLOC(N),DLM2,N=1,NTLOC)
      WRITE(6,12200) (DLM1,OGLOC(N),DLM2,N=1,NTLOC)
      WRITE(30,12300) (PTLOC(N),N=1,NTLOC)
      WRITE(6,12300) (PTLOC(N),N=1,NTLOC)
      WRITE(30,12400) (FALOC(N),N=1,NTLOC)
      WRITE(6,12400) (FALOC(N),N=1,NTLOC)
      WRITE(30,12500) (HLLOC(N),N=1,NTLOC)
      WRITE(6,12500) (HLLOC(N),N=1,NTLOC)
      WRITE(30,12600) (LTABLE(N),N=1,NTLOC)
      WRITE(6,12600) (LTABLE(N),N=1,NTLOC)
      WRITE(30,11200)
      WRITE(6,11200)
C     WRITE ORGAN DOSE WEIGHTING FACTOR  TO BE READ BY DARTAB
C      AS NAMELIST/ORGANF/.
C
      WRITE(30,12700) NORGB,(DLM1,ORGB(N),DLM2,N=1,NORGB)
      WRITE(6,12700) NORGB,(DLM1,ORGB(N),DLM2,N=1,NORGB)
      WRITE(30,12800) (IPATH(N),N=1,NORGB)
      WRITE(6,12800) (IPATH(N),N=1,NORGB)
      WRITE(30,12900) (ORGDAT(N),N=1,NORGB)
      WRITE(6,12900) (ORGDAT(N),N=1,NORGB)
      WRITE(30,11200)
      WRITE(6,11200)
C
C     REWIND AIRDOS (26) AND DOSE-RISK (25) DATA SETS
C     REWIND SPDA INPUT (30) DATA SET
C
      REWIND 25
      REWIND 26
      REWIND 30
C
      STOP
10000 FORMAT(1H0,'THE FOLLOWING AIRDOS NUCLIDES CANNOT BE PROCESSED:',/)
10100 FORMAT(1H ,A8,1PE10.2,1X,A1,4(1PE10.2),I3)
10200 FORMAT('0***FOR NUCLIDE : ',A8/
     > ' THE PARTICLE SIZE HAS BEEN CHANGED FROM ',F9.3,' TO ',F9.3/
     > ' THE RESP CLEARANCE CLASS HAS BEEN CHANGED FROM ',A1, ' TO ',A1)
10300 FORMAT('***FOR NUCLIDE : ',A8/
     > ' THE GI ABSORPTION FACTORS HAVE BEEN CHANGED FROM',4E12.4/
     > ' TO ',4E12.4)
10400 FORMAT(1H0,'UNDEFINED PATHWAY.  NUC=',A8,2H, ,'IND=',I2)
10500 FORMAT('**ILLEGAL INDICATOR : ',I4)
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10600 FORMAT(1H0,'M    NUCAIR RESPN   PSIZN                ',
     > 'GIABS(1)-GIABS(4)  INDICATORS:',
     > '  2  3  4  5 12 13 14 15 33 96 97 98 99'/)
10700 FORMAT(1H ,I2,2X,A8,2X,A1,1X,5(1PE10.2),3X,13I3)
10800 FORMAT(20A4)
10810 FORMAT(1H1,20A4)
10900 FORMAT(1H ,'&INPUT ILOC=',I2,', JLOC=',I2,', PLOC=',F5.1,1H,/
     >  1H ,'ILET=',2(I2,1H,)/
     >  1H ,'DTABLE=',7(I2,1H,)/
     >  1H ,'RTABLE=',7(I2,1H,)/
     >  1H ,'FTABLE=',7(I2,1H,)/
     >  1H ,'OUTPUT=',L1,1H,/
     >  1H ,'GSCFAC=',F5.3,1H,/
     >  1H ,'ICRP=',I1,', IHEAD=',I1/
     >  1H ,'&END')
11000 FORMAT(1H ,'&ORGAN NORGN=',I5,1H,/1H ,'ORGN=',(T7,5(A2,A8,A2)))
11100 FORMAT(1H ,'TIME=',(T7,10(F5.1,1H,)))
11200 FORMAT(1H ,'&END')
11210 FORMAT(1H ,'&QFACTR'/1H ,'HLET=',(1H ,T7,10(F4.1,1H,)))
11220 FORMAT(1H ,'LLET=',(1H ,T7,10(F4.1,1H,)))
11300 FORMAT(1H ,'&GENTIC GENEFF=',L1,2H, ,'NGEN=',I3,1H,/ 1H ,'GEN=',(
     > T6,5(A2,A8,A2)))
11400 FORMAT(1H ,'GRFAC=',2(1PE10.3,1H,)/1H ,'REPPER=',0PF10.6,1H,/ 1H ,
     > 'GLLET=',3(F8.2,1H,)/1H ,'GHLET=',3(F8.2,1H,))
11500 FORMAT(1H ,'&CANCER NCANC=',I5,1H,/1H ,'CANC=',(T7,5(A2,A8,A2)))
11600 FORMAT(1H ,'RELABS=',(T9,10(F4.1,1H,)))
11700 FORMAT(1H ,'&RNUCLD NONCLD=',I5,1H,/ 1H ,'NUCLID=',(T9,5(A2,A8,A2)
     > ))
11800 FORMAT(1H ,'PSIZE=',(T8,10(F5.2,1H,)))
11900 FORMAT(1H ,'RESP=',(T8,10(3A2)))
12000 FORMAT(1H ,'GIABS=',(T8,4(1PE10.3,1H,)))
12100 FORMAT(1H ,'&LOCTBL NTLOC=',I5,1H,/1H ,'RNLOC=',(T8,5(A2,A8,A2)))
12200 FORMAT(1H ,'OGLOC=',(T8,5(A2,A8,A2)))
12300 FORMAT(1H ,'PTLOC=',(T8,10(I3,1H,)))
12400 FORMAT(1H ,'FALOC=',(T8,10(I3,1H,)))
12500 FORMAT(1H ,'HLLOC=',(T8,10(I3,1H,)))
12600 FORMAT(1H ,'LTABLE=',(T9,10(I3,1H,)))
12700 FORMAT(1H ,'&ORGANF NORGB=',I5,1H,/1H ,'ORGB=',(T7,5(A2,A8,A2)))
12800 FORMAT(1H ,'IPATH=',(T8,10(I3,1H,)))
12900 FORMAT(1H ,'ORGDAT=',(T9,5(F7.4,1H,)))
      END
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