

US EPA ARCHIVE DOCUMENT

THE CLEAN AIR ACT ASSESSMENT PACKAGE-1988
(CAP-88)
A DOSE AND RISK ASSESSMENT METHODOLOGY
FOR RADIONUCLIDE EMISSIONS TO AIR

VOLUME 2

APPENDICES A - H

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APPENDIX A

AIRDOS-EPA (AIRDOS2.FOR) PROGRAM FILE

AIRDOS-EPA (AIRDOS2.FOR) Program File

0 1 2 3 4 5 6 7
12345678901234567890123456789012345678901234567890123456789012

```

C
C      AIRDOS2 PA CODE
C
C      R. E. MOORE HEALTH AND SAFETY RESEARCH DIV. ORNL
C      DOSEN MODIFIED TO SUPPRESS PRINT FOR NSTB.NE.1. 11/10/82
C
C      ADP 534 MODIFICATIONS JUNE 1988 BY CARYN PLUMMER.
C
COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD, ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11), ORMODI(36,12,8)
> , VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
COMMON /OCOMCHAR/ NAMNUC(36),WORD
CHARACTER*8 NAMNUC,WORD
CHARACTER*36 DATE_AND_TIME

INTEGER OPTION(9)
DATA DATE_AND_TIME '/'

CALL ERRSET(208,256,-1,1)

C*** GET DATE AND TIME
      READ(50,1000) DATE_AND_TIME
1000 FORMAT(A)

      READ(50,9004)WORD,OPTION
      WRITE(6,9005)
      WRITE(6,9006)
      WRITE(6,9007)
      IF (OPTION(1).EQ.1) WRITE(6,9008)
      IF (OPTION(1).EQ.2) WRITE(6,9017)
      IF (OPTION(2).EQ.1) WRITE(6,9009)
      IF (OPTION(2).EQ.0) WRITE(6,9019)
C
      IF (OPTION(3).EQ.0) WRITE(6,9011)
      IF (OPTION(3).EQ.1) WRITE(6,9010)
C
      IF (OPTION(4).EQ.0) WRITE(6,9012)
      IF (OPTION(4).EQ.1) WRITE(6,9013)
      IF (OPTION(4).EQ.2) WRITE(6,9014)
C
      IF (OPTION(5).EQ.1.AND.OPTION(2).EQ.1) WRITE(6,9015)
      IF (OPTION(5).EQ.1.AND.OPTION(2).NE.1) WRITE(6,9016)
      IF (OPTION(5).EQ.1.AND.OPTION(2).NE.1) STOP
C
      IF (OPTION(6).NE.0) WRITE(6,9018)OPTION(6)

```


AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

```

      IF (OPTION(7).EQ.1) WRITE(6,9000)
      IF (OPTION(8).EQ.1) WRITE(6,9001)
      IF (OPTION(9).EQ.1) WRITE(6,9002)

```

C

```

      CALL CONCEN(OPTION(2),OPTION(3),OPTION(4),OPTION(5),OPTION(6),
> OPTION(7),OPTION(8),OPTION(9),DATE_AND_TIME)
      IF (OPTION(1).EQ.0) CALL DOSEN(DATE_AND_TIME)
      STOP
9000 FORMAT(' ',T30,'THE CALCULATIONS ARE MADE FOR A UNIFORM CIRCULAR A
>REA SOURCE')
9001 FORMAT(' ',T30,'THE MAIN OUTPUT TABLE IN SUBROUTINE CONCEN IS NOT
>PRINTED')
9002 FORMAT(' ',T30,'THE CHI/Q TABLES ARE NOT PRINTED')
9004 FORMAT(A8,5I1,I2,3I1)
9005 FORMAT('1',T50,'OUTPUT OF AIRDOS-EPA COMPUTER CODE')
9006 FORMAT('0')
9007 FORMAT(' ',T20,'OPTIONS SELECTED--')
9008 FORMAT('0',T30,'PROGRAM TERMINATED AFTER PRINTING RADIONUCLIDE CON
>CENTRATIONS')
9009 FORMAT(' ',T30,'RADIONUCLIDE CONCENTRATIONS ARE LISTED FOR DIRECTI
>ON AND DISTANCE FROM FACILITY')
9010 FORMAT(' ',T30,'RADIONUCLIDE CONCENTRATIONS LISTED ARE PLUME CENTE
>RLINE VALUES')
9011 FORMAT('0',T30,'RADIONUCLIDE CONCENTRATIONS LISTED ARE SECTOR-AVER
>AGED VALUES')
9012 FORMAT(' ',T30,'PLUME RISE IS COMPUTED FOR BUOYANT PLUMES BY BRIGG
>S EQUATIONS')
9013 FORMAT(' ',T30,
> 'PLUME RISE IS COMPUTED FOR MOMENTUM-TYPE EMISSIONS')
9014 FORMAT(' ',T30,'SPECIFIC PLUME RISE USED FOR EACH AIR STABILITY CL
>ASS (METERS)-')
9015 FORMAT('0',T30,'DEPOSITION VELOCITY IS VARIED WITH DIRECTION AND D
>ISTANCE')
9016 FORMAT('0',T30,'ERROR--ILLEGAL USE OF VARIABLE DEPOSITION VELOCITY
> WITH SQUARE GRID')
9017 FORMAT('0',T30,'DOSES ARE CALCULATED FROM INPUT AIR CONCENTRATIONS
> AND GROUND DEPOSITION RATES')
9018 FORMAT(' ',T30,'AIR CONCENTRATIONS AND GROUND DEPOSITION RATES ARE
> PUNCHED ON CARDS FOR THE FIRST ',I2,' RADIONUCLIDES')
9019 FORMAT(' ',T30,'THE ASSESSMENT AREA IS A 20 BY 20 SQUARE GRID')
      END

```

```

BLOCK DATA
REAL KIQ
COMMON /TCOM/ KIQ(36,20,20)
COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD,ACON(36,20,20),

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
12345678901234567890123456789012345678901234567890123456789012							

```
>GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11),ORMODI(36,12,8),
>VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
DATA KIQ /14400*0.0/,VDCOEF /400*1.0/,ORMODI /3456*0/
DATA ACON /14400*0.0/,GCON /14400*0.0/
END
```

C*****
C*****

```
SUBROUTINE CHIQ
COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD, ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11), ORMODI(36,12,8)
> , VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
COMMON /OCOMCHAR/ NAMNUC(36),WORD
CHARACTER*8 NAMNUC,WORD
COMMON /PCOM/ REL(6,36),IDIST(20),NUMST
COMMON /TCOM/ KIQ(36,20,20)
DIMENSION REGL(36)
REAL KIQ
DO 50 I=1,NNUCS
  REGL(I)=0
  DO 40 J=1,NUMST
40    REGL(I)=REGL(I)+REL(J,I)
50    CONTINUE
  DO 90 I=1,NNUCS
    DO 80 NO=NOL,NOU
      DO 60 NR=NRL,NRU
        IF (REGL(I).EQ.0) GO TO 70
60      KIQ(I,NO,NR)=(ACON(I,NO,NR)/REGL(I))*1.E6
        GO TO 80
70      KIQ(I,NO,NR)=0.
80      CONTINUE
90      CONTINUE
    DO 130 I=1,NNUCS
      WRITE(51,9000)NAMNUC(I)
      WRITE(51,9001)
      WRITE(51,9002)
      WRITE(51,9003)
      WRITE(51,9001)
      WRITE(51,9004)
      WRITE(51,9005)
      NO=1
      DO 100 NR=NRL,NRU
100    WRITE(51,9007)IDIST(NR),KIQ(I,NO,NR),KIQ(I,NO+1,NR),KIQ(I,
>    NO+2,NR),KIQ(I,NO+3,NR),KIQ(I,NO+4,NR),KIQ(I,NO+5,NR),
>    KIQ(I,NO+6,NR), KIQ(I,NO+7,NR)
      ISP=(22-2*(NRU/2))/2
      DO 110 IG=1,ISP
```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

```

110      WRITE(51,9001)
        WRITE(51,9006)
        WRITE(51,9005)
        NO=9
        DO 120 NR=NRL,NRU
120      WRITE(51,9007) IDIST(NR), KIQ(I,NO,NR), KIQ(I,NO+1,NR), KIQ(I,
>         NO+2,NR), KIQ(I,NO+3,NR), KIQ(I,NO+4,NR), KIQ(I,NO+5,NR),
>         KIQ(I,NO+6,NR), KIQ(I,NO+7,NR)
130      CONTINUE
        RETURN
9000     FORMAT('1',T25,'GROUND-LEVEL CHI/Q VALUES FOR ',A8,
>         'AT VARIOUS DISTANCES IN EACH COMPASS DIRECTION')
9001     FORMAT('0')
9002     FORMAT(' ',T20,'DISTANCE',T52,'CHI/Q TOWARD INDICATED DIRECTION')
9003     FORMAT(' ',T20,'(METERS)',T60,'(SEC/CUBIC METER)')
9004     FORMAT(' ',T32,'N',T43,'NNW',T54,'NW',T65,'WNW',T76,'W',T87,'WSW',
>         T98,'SW',T109,'SSW')
9005     FORMAT(' ')
9006     FORMAT(' ',T32,'S',T43,'SSE',T54,'SE',T65,'ESE',T76,'E',T87,'ENE',
>         T98,'NE',T109,'NNE')
9007     FORMAT(' ',T19,I7,T30,E9.3,T41,E9.3,T52,E9.3,T63,E9.3,T74,E9.3,
>         T85,E9.3,T96,E9.3,T107,E9.3)
        END
C*****
C*****
      (SUBROUTINE) CONCEN(LORT,LOST,LRISE,LDEP,LPUN,LARE,LTAB,LCHI,
+         DATE_AND_TIME)

C
      COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD, ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11), ORMODI(36,12,8)
> , VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
      COMMON /PCOM/ REL(6,36),IDIST(20),NUMST
      COMMON /FCOM/ FEQWL,INTPA(20,20)
      COMMON /OCOMCHAR/ NAMNUC(36),WORD
      CHARACTER*8 NAMNUC,WORD
      CHARACTER*3 DIRECTION(16)
      CHARACTER*36 DATE_AND_TIME
      INTEGER ALPH
      LOGICAL RADON_FLAG

C
      DIMENSION AA(7,4,4),DIA(6),FRAW(7,16),PERD(16),AVON(20,20), PH(6),
> PR(7),QH(6), SC(36),TAI(36),TG(3),TGD(36), UDAV(7,16), UDCAT(7,
> 16),VEL(6),VG(36),NOMA(36),NSPTMO(20,20),NSPTM1(200),NSPTM2(200),
> FDSTOR(36,6,7),BOUND(21),LIST(20),TQ(36)
      DIMENSION DIM(6)

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

```

DATA AVON/400*0/
DATA NOMA/36*0/,ALPH/0/
DATA RADON_FLAG /.FALSE./
DATA DIRECTION/'N ', 'NNW', 'NW ', 'WNW', 'W ', 'WSW', 'SW ', 'SSW',
> 'S ', 'SSE', 'SE ', 'ESE', 'E ', 'ENE', 'NE ', 'NNE'/
EQUIVALENCE (NSPTMO(1,1),NSPTM1(1)),(NSPTMO(1,11),NSPTM2(1))
DATA NSPTM1/ 07,07,07,07,08,08,08,08,09,09,09,09,10,10,10,10,11,
> 11,11,11, 07,07,07,07,08,08,08,08,09,09,09,09,10,10,10,10,11,11,
> 11;11, 07,07,07,07,07,08,08,08,08,09,09,10,10,10,10,11,11,11,11,
> 11, 07,07,07,07,07,07,08,08,08,09,09,10,10,10,11,11,11,11,11,
> 06,06,07,07,07,07,08,08,08,09,09,10,10,10,11,11,11,11,12,12, 06,
> 06,06,07,07,07,07,08,08,09,09,10,10,11,11,11,11,12,12,12, 06,06,
> 06,06,06,07,07,07,08,09,09,10,11,11,11,12,12,12,12,12, 06,06,06,
> 06,06,06,07,07,08,09,09,10,11,11,12,12,12,12,12,12, 05,05,06,06,
> 06,06,06,06,07,08,10,11,12,12,12,12,12,12,13,13, 05,05,05,05,05,
> 05,05,05,06,07,11,12,13,13,13,13,13,13,13,13/
DATA NSPTM2/ 05,05,05,05,05,05,05,05,04,03,15,14,13,13,13,13,13,
> 13,13,13, 05,05,04,04,04,04,04,04,03,02,16,15,14,14,14,14,14,
> 13,13, 04,04,04,04,04,04,03,03,02,01,01,16,15,15,14,14,14,14,
> 14, 04,04,04,04,04,03,03,03,02,01,01,16,15,15,15,14,14,14,14,
> 04,04,04,03,03,03,03,02,02,01,01,16,16,15,15,15,15,14,14, 04,
> 04,03,03,03,03,02,02,02,01,01,16,16,16,15,15,15,15,14,14, 03,03,
> 03,03,03,03,02,02,02,01,01,16,16,16,15,15,15,15,15,15, 03,03,03,
> 03,03,02,02,02,02,01,01,16,16,16,16,15,15,15,15,15, 03,03,03,03,
> 02,02,02,02,01,01,01,01,16,16,16,16,15,15,15,15, 03,03,03,03,02,
> 02,02,02,01,01,01,01,16,16,16,16,15,15,15,15/

```

C

C-----THIS ARRAY HOLDS THE VALUES FOR CONSTANTS ASSOCIATED WITH EACH
C-----OF THE 7 PASQUILL AIR STABILITY CATAGORIES (A,C,D,F).

C

```

DATA AA/.9757,.9986,.9767,.9600,.9615,.9733,.9986, .8660,.8493,
> .8540,.8670,.8670,.8540,.8360, .8660,.8493,.8540,.8670,.8670,
> .8540,.8360, .6294,.6303,.6254,.6342,.6260,.6342,.8360, 3.928,
> 6.205,7.623,10.00,14.13,21.28,31.03, 1.841,2.213,3.266,5.261,
> 7.357,9.333,10.093, 1.841,2.213,3.266,5.261,7.357,9.333,10.093,
> .2083,.2946,.3977,.6166,.8042,1.233,10.093, 1.000,1.000,.9540,
> .8061,.8600,.8823,.8257, 1.000,1.000,.8330,.6715,.6290,.6321,
> .6547, 1.000,1.000,.8330,.5099,.4054,.3710,.3818, 1.000,1.000,
> .5524,.5251,.1110,.1106,.1106, 5.020,8.350,10.015,7.48,15.50,
> 34.70,61.25, 5.020,8.350,4.400,2.950,3.150,6.132,18.80, 5.020,
> 8.350,4.400,.8100,.5240,.7640,2.115, 5.020,8.350,.3320,.9300,
> .0349,.0694,.1739/

```

C

C---END OF DECLARATIONS

C

READ(50,9008)NOL,NOU,NRL,NRU

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

```

      READ(50,9009)PR
      READ(50,9011)WORD
      READ(50,9009)SQSD
      READ(50,9000)SEQWL
      READ(50,9008)IDIST
      READ(50,9011)WORD
      READ(50,9008)LIDA1
      READ(50,9009)RR,TA,TG
      READ(50,9010)PERD
      READ(50,9010)((UDCAT(I,J),J=1,16),I=1,7)
      READ(50,9010)(( UDAV(I,J),J=1,16),I=1,7)
      READ(50,9012)FRAW
      READ(50,9011)WORD
      READ(50,9008)NUMST
      DO 30 J=1,NUMST
30    READ(50,9009)PH(J),DIA(J),VEL(J),QH(J),DIM(J)
      READ(50,9011)WORD
      READ(50,9008)NNUCS
      DO 40 I=1,NNUCS
      READ(50,9011) NAMNUC(I)
      IF ( NAMNUC(I) .EQ. 'RN-222' ) THEN
        RADON_FLAG = .TRUE.
      ENDIF
      READ(50,9009)ANLAM(I),SC(I),VD(I),VG(I)
40    READ(50,9009)(REL(J,I),J=1,NUMST)
      IF (LDEP.EQ.1) THEN
        READ(50,9009) (BOUND(I),I=2,21)
        READ(50,9059) ((VDCOEF(I,J),J=NRL,NRU),I=NOL,NOU)
        READ(50,9060) LIST
        BOUND(1)=0.0
      ELSE
        LID1=LIDA1
        FEQWL=SEQWL
        LA1=LIDA1
      ENDIF
      IF (LIDA1.EQ.10000) LA1=ALPH
130 IF (LTAB.EQ.0) THEN
      WRITE(51,90521) DATE_AND_TIME
      WRITE(51,9052)
      WRITE(51,9053)
      IF ( RADON_FLAG ) THEN
        WRITE(51,9054)
      ELSE
        WRITE(51,90541)
      ENDIF
      WRITE(51,9013)

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
123456789012345678901234567890123456789012345678901234567890123456789012							

```

        ENDIF
        DO 170 I=1, NNUCS
            DO 160 J=1, NUMST
                160      REL(J,I)=REL(J,I)*3.17098E4
                170      CONTINUE
C---END OF INPUT ROUTINE
C
C---THIS SUBROUTINE CALCULATES AIR CONCENTRATION(ACON)
C---AND GROUND DEPOSITION RATE(GCON)
C-----IF(EXP(-(ANLAM(I)*SQRT(2*10*SQSD**2)/(2*8.64E4)).LT.0.99))
C-----REDUCES TO
C-----IF(ANLAM(I).GT.(122.188054/SQSD))
        DISTG=122.188054/SQSD
C
C-----THIS BLOCK EXAMINES CERTAIN INPUT VALUES FOR EQUALITY. IF THEY
C-----ARE EQUAL, THEN MUCH OF THE FOLLOWING CALCULATION NEED NOT BE
C-----PERFORMED FOR THAT NUCLIDE. NOMA IS THE ARRAY OF FLAGS THAT
C-----EQUALITY HAS BEEN FOUND & WITH WHICH NUCLIDE.
C
        IF(NNUCS.GE.2) THEN
            DO 192 I=2, NNUCS
                IEN=I-1
                DO 190 M=1, IEN
                    IF (REL(1,M).EQ.0) GO TO 190
                    IF (VD(I).NE.VD(M)) GO TO 190
                    IF (VG(I).NE.VG(M)) GO TO 190
                    IF (SC(I).NE.SC(M)) GO TO 190
                    IF (ANLAM(I).GT.DISTG) GO TO 190
                    IF (ANLAM(M).GT.DISTG) GO TO 190
                    NOMA(I)=M
                    GO TO 192
                190      CONTINUE
                192      CONTINUE
            ENDIF
C
C-----THIS BLOCK LOOPS THRU THE GRID COVERING THE AREA AROUND THE PLANT.
C
        DO 680 NO=NOL, NOU
            DO 200 I=1, NNUCS
                IF (LDEP.NE.1) GO TO 210
                DO 200 J=1, NUMST
                    DO 200 K=1, 7
                        FDSTOR(I,J,K)=1
                    200      CONTINUE
                210      DO 670 NR=NRL, NRU
                    DO 220 I=1, NNUCS

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

```

      TQ(I)=0.
      TAI(I)=0.
220      TGD(I)=0.
240      X=IDIST(NR)
      MO=NO
250      XO=X
      THETA=1.0
      M=0

C
C-----THIS BLOCK LOOPS THRU THE STACKS (EMISSION POINTS).
C
      DO 600 J=1,NUMST
      M=0
      IF (LARE.EQ.0) GO TO 290

C
C-----AREA SOURCE BLOCK (BY CHRISTOPHER B. NELSON,EPA).
C
C... CONSIDER SOURCES TO BE POINT SOURCES IF LESS THAN 10 METERS
C... DIAM. OR IF RATIO OF DISTANCE X TO THE DIAM. IS GREATER THAN 2.5.
C
      TESTAR=X/(DIM(J)+.00001)
      IF (DIM(J).LT.10..OR.TESTAR.GT.2.5) GO TO 290

C
C... R0 IS THE RADIUS OF THE SOURCE.
C... R1 IS THE INNER RADIUS OF THE TRANSFORMED SOURCE.
C... R2 IS THE OUTER RADIUS OF THE TRANSFORMED SOURCE.
C... X IS THE EFFECTIVE DISTANCE FOR CALCULATING CHI/Q.
C... THETA IS THE ANGULAR WIDTH IN SECTORS OF THE TRANSFORMED SOURCE.
C... (MULTIPLY THETA BY PI/8.0 TO CONVERT THETA TO RADIANS.)
C... 0.88622693=SQRT(PI/4.)
C... 2.5198421=4.0**(2/3)
C... 4.5135167=8./SQRT(PI)
C
      R0=DIM(J)/2.0
      IF (X0.GT.0.88622693*R0) GO TO 270
      IF (X0.GT.0.5*R0) GO TO 260

C
C... 0.LE.X0.LE.R0/2.
      R1=0.
      R2=R0
      X=R2/2.5198421
      THETA=16.
      GO TO 280

C
C... R0/2.LT.X0.LE.R0*SQRT(PI/4.)
260      R1=0.

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

R2=2.*X0
X=R2/2.5198421
THETA=4.0*(R0/X0)**2
GO TO 280

```

```

C
C... R0*SQRT(PI/4).LT.X0
270      R1=X0-0.88622693*R0
          R2=X0+0.88622693*R0
          X=(X0*(SQRT(R2)+SQRT(R1))/2.0)**0.66666667
          THETA=4.5135167*R0/X0

```

```

C
C... M IS THE NUMBER OF SECTORS ON EACH SIDE OF MO WHICH
C... INCLUDE THE TRANSFORMED SOURCE.
280      M=INT(THETA/2.0+0.5)
C... DTHETA IS THE ANGULAR WIDTH OF THE TRANSFORMED SOURCE IN THE FIRST
C... AND LAST SECTORS.

```

```

          DTHETA=AMOD((THETA/2.0+0.5),1.0)
          IF (DTHETA.LE.0.) THEN
            M=M-1
            DTHETA=1.0
          ENDIF

```

```

290      IF (M.EQ.0) DTHETA=THETA
C... LL IS THE TOTAL NUMBER OF SECTORS WHICH CONTRIBUTE TO CHI/Q.
          LL=2*M+1
C... L1 IS THE INITIAL SECTOR.

```

```

          L1=MOD(MO-M+15,16)+1
          DO 580 L=1,LL
            MO=MOD(L1+L+14,16)+1
            IF (L.EQ.1.OR.L.EQ.LL) THEN
              PERW=PERD(MO)*DTHETA/THETA
            ELSE
              PERW=PERD(MO)/THETA
            ENDIF

```

```

C
C-----END OF AREA SOURCE BLOCK.
C
C-----THIS BLOCK LOOPS THRU THE 7 PASQUILL AIR STABILITY CATEGORIES.
C

```

```

310      DO 580 JH=1,7
          IF (FRAW(JH,MO).EQ.0) GO TO 580
          U = UDAV(JH,MO)
          UD=UDCAT(JH,MO)
          IF (U.GT.6.OR.U.LT.1.) THEN
            FF1=0.
            FF2=1.
            FF3=0.

```


AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
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```

                                ELSE
                                FF2=(1.167-U/6.-1./UD)/(1.167-U/6.-1./U)
                                FF3=((U-1.)*(1.-FF2))/5.
                                FF1=1.-FF2-FF3
                                ENDIF
C-----THIS BLOCK CALCULATES PLUME RISE
C-----RISE=0..BRIGGS' EQUATIONS FOR BUOYANT PLUMES
C-----RISE=1..RUPP'S EQUATIONS FOR MOMENTUM-TYPE EMISSIONS
C-----RISE=2..READ PLUME RISE FROM CARDS
330      IF (LRISE.EQ.0) THEN
          IF (JH.GT.4) THEN
              S=9.80665/TA*(TG(JH-4)+.0098)
              IF (X.LE.2.4*U/SQRT(S)) THEN
                  H =PH(J)+(1.6/U*( (.000037*QH(J)*X*X)**
>                  .33333333 ))
              ELSE
                  H =PH(J)+(2.9*( (.000037*QH(J)/U/S)**
>                  .33333333 ))
              ENDIF
          ELSE
              IF (X.LE.10.*PH(J)) THEN
                  H =PH(J)+(1.6/U*( (.000037*QH(J)*X*X)**
>                  .33333333 ))
              ELSE
                  H =PH(J)+(1.6/U*( (.0037000*QH(J)*PH(J)*PH(J)
>                  )** .33333333))
              ENDIF
          ENDIF
      ELSE
          IF (LRISE.EQ.1) H=PH(J)+1.5*VEL(J)*DIA(J)/U
          IF (LRISE.EQ.2) H=PH(J)+PR(JH)
      ENDIF
C      END OF PLUME RISE CALCULATIONS
380      NX=1
          IF (X.GT.1000) NX=2
          IF (X.GT.3000) NX=3
          IF (X.GT.10000) NX=4
          A=AA(JH,NX,1)
          C=AA(JH,NX,2)
          D=AA(JH,NX,3)
          F=AA(JH,NX,4)
C
C-----THIS BLOCK LOOPS THRU THE DIFFERENT NUCLIDES RELEASED IN THE PLUME
C
          DO 570 I=1,NNUCS
              IF (NOMA(I).GT.0.AND.J.EQ.1) GO TO 570

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>123456789012345678901234567890123456789012345678901234567890123456789012</u>							

```

C-----DETERMINE XLIDO (VALUE OF X WHERE LID AFFECTS VERTICAL DISPERSION)
      Y1=0.
      Y2=10000.
      DO 410 IX1=1,3
        DO 390 IX2=1,10
          Y=Y1+Y2*IX2
          IF (Y**D.GT. (.47*F*(LID1+Y*VG(I)/UD)
            >          )) GO TO 400
          CONTINUE
        390      Y1=Y1+Y2*(IX2-1)
        400      Y2=Y2/10.
        410      XLIDO=2.*Y
C-----THIS BLOCK FINDS DEPLETION FRACTION
      VD1=VD(I)
C-----SECTION TO FIND DEPLETION IF BY VARIABLE DEPOSITION
C-----LDEP=1 IS OPTION FOR VARIABLE DEPOSITION VELOCITY
C-----BOUND(NR) IS THE LOWER BOUND ON THE INTERVAL OF INTEGRATION
C-----BOUND(NR+1) IS THE UPPER BOUND
      IF (LDEP.EQ.1) THEN
        VD1=VD1*VDCOEF(NO,NR)
        IF (X.LE.XLIDO) THEN
          CALL QX(BOUND(NR),X,U,UD,H,VD1,
            >          VG(I),JH,FDD)
        ELSE
          IF (BOUND(NR).LT.XLIDO) THEN
            CALL QX(BOUND(NR),XLIDO,U,UD,H,
              >            VD1,VG(I),JH, FDD)
          ENDIF
        ENDIF
        FDD=FDD*FDSTOR(I,J,JH)
        IF (X.NE.BOUND(NR+1)) THEN
          IF (BOUND(NR+1).GT.XLIDO) THEN
            IF (X.GT.XLIDO) THEN
              FD1=EXP(-((BOUND(NR+1)-
                >                XLIDO)*VD1/(LID1*UD)))
              FDSTOR(I,J,JH)=FDD*FD1
            ELSE
              CALL QX(X,BOUND(NR+1),U,UD,H,
                >                VD1,VG(I),JH,FD1)
              FD1=FD1*EXP(-((BOUND(NR+1)-
                >                XLIDO)*VD1/(LID1* UD)))
              FDSTOR(I,J,JH)=FDD*FD1
            ENDIF
          ELSE
            CALL QX(X,BOUND(NR+1),U,UD,H,VD1,
              >            VG(I),JH,FD1)
          ENDIF

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
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```

                                FDSTOR(I,J,JH)=FDD*FD1
                                ENDIF
                                ELSE
                                FDSTOR(I,J,JH)=FDD*FD1
                                ENDIF
                                ELSE
                                IF (X.LE.XLIDO) THEN
                                IF (VG(I).EQ.0) THEN
                                CALL QY(0,X,U,UD,H,VD1,VG(I),JH,FDD)
                                ELSE
                                CALL QX(0,X,U,UD,H,VD1,VG(I),JH,FDD)
                                ENDIF
                                ELSE
                                IF (VG(I).EQ.0) THEN
                                CALL QY(0,XLIDO,U,UD,H,VD1,
>                                     VG(I),JH,FDD)
                                ELSE
                                CALL QX(0,XLIDO,U,UD,H,VD1,
>                                     VG(I),JH,FDD)
                                ENDIF
                                FDD=FDD*EXP(-(X-XLIDO)*
>                                     VD1/(LID1*UD)))
                                ENDIF
                                ENDIF
C-----END VARIABLE DEPOSITION SECTION
C-----SECTION FOR DEPLETION IF BY CONSTANT DEPOSITION
                                IF (X.LE.XLIDO) THEN
                                IF (VG(I).EQ.0) THEN
                                CALL QY(0,X,U,UD,H,VD1,VG(I),JH,FDD)
                                ELSE
                                CALL QX(0,X,U,UD,H,VD1,VG(I),JH,FDD)
                                ENDIF
                                ELSE
                                IF (VG(I).EQ.0) THEN
                                CALL QY(0,XLIDO,U,UD,H,VD1,VG(I),
>                                     JH,FDD)
                                ELSE
                                CALL QX(0,XLIDO,U,UD,H,VD1,VG(I),
>                                     JH,FDD)
                                ENDIF
                                FDD=FDD*EXP(-(X-XLIDO)*VD1/
>                                     (LID1*UD)))
                                ENDIF
C-----END CONSTANT DEPOSITION SECTION
C-----END DEPLETION FRACTION BLOCK
                                QRED=ANLAM(I)*X/86400.

```

[illegible]

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

630      IF (LDEP.EQ.1.AND.LIST(NR).EQ.1) GO TO 670
650      DO 660 I=1,NNUCS
          - ACON(I,NO,NR)=TAI(I)/1000000.  Concentration in air at ground level
          GCON(I,NO,NR)=TGD(I)/10000.    - rate of deposition on ground
          VD1=VD(I) Dry Deposition velocity
          IF (LDEP.EQ.1) VD1=VD1*VDCOE(No,NR)
          DRYCON=ACON(I,NO,NR)*VD1*100
          WETCON=(GCON(I,NO,NR)-DRYCON)*(SC(I)/(SC(I)+1.E-30))
          IF (LTAB.EQ.1) GO TO 660

```

```

C***** IF RADON OUTPUT ACON IN PCI/LITER OTHERWISE OUTPUT IN PCI/M**3
C***** CURRENT CALCULATION IS IN PCI/CM**3

```

```

          IF ( RADON_FLAG ) THEN
              WRITE(51,9058) DIRECTION(NO),IDIST(NR),NAMNUC(I),
+                               1000*ACON(I,NO,NR),DRYCON,WETCON,
+                               GCON(I,NO,NR)
          ELSE
              WRITE(51,9058) DIRECTION(NO),IDIST(NR),NAMNUC(I),
+                               1000000*ACON(I,NO,NR),DRYCON,WETCON,
+                               GCON(I,NO,NR)
          ENDIF

```

```

660      CONTINUE
670      CONTINUE
680      CONTINUE

```

```

      IF (LCHI.EQ.0) CALL CHIQ --

```

```

C-----END OF GRID LOOP-----

```

```

720 RETURN
9000 FORMAT(F10.0)
9001 FORMAT('1',T30,'NOTE-THE AREA SURROUNDING THE PLANT IS A SQUARE
>WITH AN AREA')
9002 FORMAT(' ',T35,'OF',F10.1,1X,
> 'SQUARE KILOMETERS WITH THE PLANT AT THE CENTER.')
9003 FORMAT(' ',T35,'THE SQUARE AREA IS ALIGNED DUE NORTH-SOUTH AND EAS
>T-WEST. THE')
9004 FORMAT(' ',T35,'400 SMALLER SQUARES, WHICH ARE EACH ',F7.1,1X,
> 'METERS ON A SIDE,')
9005 FORMAT(' ',T35,'ARE IDENTIFIED BY COLUMN AND ROW. COLUMNS ARE NUMB
>ERED FROM')
9006 FORMAT(' ',T35,'1 TO 20 FROM WEST TO EAST. ROWS ARE NUMBERED FROM
>1 TO 20 FROM')
9007 FORMAT(' ',T35,'SOUTH TO NORTH.')
9008 FORMAT(8I10)
9009 FORMAT(8F10.0)
9010 FORMAT(16F5.0)

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
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```

9011 FORMAT(A8)
9012 FORMAT(7F10.0)
9013 FORMAT('0')
90521 FORMAT('1',T10,'DATE',2X,A)
9052 FORMAT('0',T20,'ESTIMATED RADIONUCLIDE CONCENTRATIONS')
9053 FORMAT('0',' WIND',T10,'DISTANCE',T29,'AIR CONCEN',T41,
> 'DRY DEP RATE',T55,'WET DEP RATE',T69,'GND DEP RATE')
9054 FORMAT(' TOWARD',T10,'(METERS)',T20,'NUCLIDE',
> T31,'(PCI/L)',T42,'(PCI/M2/S)',T56,'(PCI/M2/S)',
> T70,'(PCI/M2/S)')
90541 FORMAT(' TOWARD',T10,'(METERS)',T20,'NUCLIDE',
> T30,'(PCI/M3)',T42,'(PCI/M2/S)',T56,'(PCI/M2/S)',
> T70,'(PCI/M2/S)')
9057 FORMAT(' ',T4,'COLUMN',T21,'ROW')
9058 FORMAT(' ',T4,A3,T10,I6,T20,A8,T31,1PE7.1,T43,1PE7.1,T57,1PE7.1,
> T71,1PE7.1)
9059 FORMAT(10F8.4)
9060 FORMAT(20I1)

```

END

FUNCTION CV(I,LAMI,DEPRAT,GCRU,TSUBE,YSUBV,TSUBH,R)

— C CALCULATES THE CONCENTRATION OF NUCLIDE I IN AND ON VEGETATION USING
C EQ C-5, REG GUIDE 1.109-25. THE INPUT PARAMETERS ARE DEFINED AS FOLLOW

```

C
C      I      INDEXES NUCLIDE
C      LAMI    RADIOACTIVE DECAY CONSTANT FOR THE NUCLIDE (HR**-1)
C      DEPRAT  DEPOSITION RATE OF RADIONUCLIDE I ONTO GROUND
C              AT THE GIVEN LOCATION ( PCI /M**2-HR)
C      TSUBE   PERIOD OF CROP, LEAFY VEGETABLE, OR PASTURE GRASS EXPOSU
C              DURING GROWING SEASON (HR)
C      YSUBV   AGRICULTURAL PRODUCTIVITY BY UNIT AREA (MEASURED IN WET
C              WEIGHT) (KG/M**2)
C      TSUBH   TIME DELAY BETWEEN HARVEST OF VEGETATION OR CROPS AND
C              INGESTION (HR)
C      R       FRACTION OF DEPOSITED ACTIVITY RETAINED
C              ON CROPS, DIMENSIONLESS
C

```

```

REAL LAMEI,LAMSI,LAMI,LAMS,LAMRR,LAMW
COMMON /INGDOS/LAMW,LAMS,TSUBB,P,BSUBV,DR,RATUA
COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD,ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11),ORMODI(36,12,8),
> VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
COMMON /OCOMCHAR/ NAMNUC(36),WORD
CHARACTER*8 NAMNUC,WORD

```

— C THE EFFECTIVE REMOVAL RATE CONSTANT FOR THE RADIONUCLIDE FROM CROPS
C IN HR**-1 IS (REG GUIDE 1.109-4)
LAMEI = LAMI + LAMW

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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C WHERE LAMW IS THE REMOVAL RATE CONSTANT FOR WEATHERING.

C

C THE FOLLOWING CODE CALCULATES CV= CONCENTRATION OF NUCLIDE I USING EQ
STUBB=TSUBB*8760.

ALT=LAMEI*TSUBE

IF (ALT.GT.0.03) GO TO 10

XNUD1=(R*DR/YSUBV)*((0.1666667*ALT-0.5)*ALT+1.0)*TSUBE

GO TO 20

10 XNUD1=(R*DR/YSUBV)*((1.0-EXP(-LAMEI*TSUBE))/LAMEI)

20 CONTINUE

LAMSI=LAMS+LAMI

ALT=LAMSI*STUBB

IF (ALT.GT.0.03) GO TO 30

XNUD2=(BSUBV/P)*((0.1666667*ALT-0.5)*ALT+1.0)*STUBB

GO TO 40

30 XNUD2=(BSUBV/P)*((1.0-EXP(-LAMSI*STUBB))/LAMSI)

40 CONTINUE

SUM=XNUD1+XNUD2

PROD=SUM*EXP(-LAMI*TSUBH)

SUM2=XNUD2

PROD2=SUM2*EXP(-LAMI*TSUBH)

RATUA=0.

IF(SUM2.NE.0.) RATUA=SUM2/SUM

CV = GCRU * PROD + (DEPRAT-GCRU)*PROD2

RETURN

END

C*****

C*****

C* NEW SUBROUTINE ADDED MAY 1988 TO VARY EQUILIBRIUM FRACTIONS *

C* OLD METHOD HAD EQUIL. FRACTIONS SET TO A CONSTANT OF .7 *

C* THE NEW METHOD VARIES THE EQUILIBRIUM FRACTIONS DEPENDING ON THE*

C* DISTANCE FROM THE SOURCE. *

C* THIS ROUTINE USES LINEAR INTERPOLATION TO DETERMINE THE EQUIL. *

C* FRACTIONS FOR DISTANCES THAT DO MATCH THE SET DISTANCES *

C* GIVEN AND THEIR EQUIL. FRACTIONS. THE EQUATION IS AS FOLLOWS *

C* $EFY = EFX + ((EFZ - EFX) * ((Y - X) / (Z - X)))$ *

C* WHERE YOU HAVE $X \frac{Y}{Z}$ *

C* X AND Z ARE THE SET DISTANCES GIVEN AND Y IS THE USER GIVEN*

C* DISTANCE (BETW X AND Z) YOU ARE FINDING THE EQ. FRACTION *

C* FOR . EFX AND EFZ IS THE SET EQUIL_FRACTIONS CORRESPONDING *

C* TO THE SET DISTANCES. *

C*****

SUBROUTINE DETERMINE_EQUIL_FRACTIONS(IDIST,
+ CALC_EQUIL_FRACTIONS,NRL,NRU)

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```
REAL CALC_EQUIL_FRACTIONS(20)
INTEGER IDIST(20), NRL, NRU
```

```
REAL SET_EQUIL_FRACTIONS(20)
REAL SET_DISTANCES(20), DISTANCES(20)
INTEGER*2 I, PTR, IN, UPPER_BOUNDRY, LOWER_BOUNDRY
```

```
C*****SET EQUILIBRIUM FRACTIONS TO CONSTANTS FOR CHOSEN DISTANCES
C*****
```

```
DATA SET_EQUIL_FRACTIONS /.267,.273,.276,.278,.284,.289,.293,.302,
+                          .311,.331,.349,.366,.382,.414,.443,.471,
+                          .522,.566,.650,.698/
DATA SET_DISTANCES / 150.,200.,250.,300.,400.,500.,600.,800.,
+                     1000.,1500.,2000.,2500.,3000.,4000.,
+                     5000.,6000.,8000.,10000.,15000.,19551./
```

```
C***** SET UPPER AND LOWER BOUNDRY OF DISTANCE ARRAY
DATA LOWER_BOUNDRY /1/,UPPER_BOUNDRY/20/
```

```
C***** SET INTEGER DISTANCES TO REALS FOR CALCULATIONS
DO 5 I = NRL,NRU
  DISTANCES(I) = IDIST(I)
```

```
5 CONTINUE
```

```
C***** IN IS THE INDEX TO THE FIRST DISTANCE SPECIFIED BY THE USER
IN = NRL
```

```
C***** LOOP UNTIL USER GIVEN DISTANCES ARE <= TO 150 AND SET EQUIL
C***** FRACTIONS TO .267 (DISTANCES <= 150 ARE ALWAYS .267 )
```

```
10 CONTINUE
```

```
IF ( ( DISTANCES(IN) .LE. SET_DISTANCES(LOWER_BOUNDRY) ) .AND.
+   ( IN .LE. NRU ) ) THEN
  CALC_EQUIL_FRACTIONS(IN) = SET_EQUIL_FRACTIONS(LOWER_BOUNDRY)
  IN = IN + 1
  GOTO 10
```

```
ENDIF
```

```
C***** PTR = Z (UPPER LIMIT)
C***** PTR - 1 = X (LOWER LIMIT)
C***** IN = Y (GIVEN DISTANCE IN WHICH EQ. FRACTIONS IS BEING
C***** DETERMINED)
```

```
PTR = 2
```

```
C***** WHILE INDEX TO USER SPECIFIED DISTANCES IS LESS THAN LAST
C***** GIVEN DISTANCES NDEX DO
```

```
20 CONTINUE
```

```
IF ( IN .LE. NRU ) THEN
```


AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

C***** WHILE INDEX TO SET DISTANCES IS <= UPPER BOUNDRY INTERPOLATE
C***** THE EQ. FRACTIONS FOR EACH DISTANCE GIVEN. IF > UPPER BOUNDRY
C***** SET FRACTION TO GIVEN FRACTION FOR DISTANCES > 19550 = .698

      IF ( PTR .LE. UPPER_BOUNDRY ) THEN
C*****      USE LINEAR EQ IF DISTANCE IS < SET DISTANCE Z
      IF ( DISTANCES(IN) .LT. SET_DISTANCES(PTR) ) THEN
          CALC_EQUIL_FRACTIONS(IN) = SET_EQUIL_FRACTIONS(PTR - 1) +
+          ((SET_EQUIL_FRACTIONS(PTR) - SET_EQUIL_FRACTIONS(PTR-1))
+          * (( DISTANCES(IN) - SET_DISTANCES(PTR - 1) ) ) /
+          (SET_DISTANCES(PTR) - SET_DISTANCES(PTR - 1)))
          IN = IN + 1
C*****      IF DISTANCES ARE = SAME EQ. FRACTIONS IE Y = Z
      ELSE IF ( DISTANCES(IN) .EQ. SET_DISTANCES(PTR) ) THEN
          CALC_EQUIL_FRACTIONS(IN) = SET_EQUIL_FRACTIONS(PTR)
          IN = IN + 1
          PTR = PTR + 1
C*****      OTHERWISE Y > Z ..NEXT SET DISTANCE
      ELSE
          PTR = PTR + 1
      ENDIF
C*****      SET REST OF FRACTIONS ALL ARE > 19550
      ELSE
          CALC_EQUIL_FRACTIONS(IN) = SET_EQUIL_FRACTIONS(UPPER_BOUNDRY)
          IN = IN + 1
      ENDIF
      GOTO 20
      ENDIF
      RETURN
      END

C*****
C*****
C*****
      SUBROUTINE DOSEN( DATE_AND_TIME )
C
C      USNRC REG. GUIDE 1.109 MODELS FOR INGESTION DOSE CALCULATIONS
C      WERE IMPLEMENTED AND INCORPORATED WITHIN DOSEN BY J. C. PLEASANT
C      OF THE MATHEMATICS DEPARTMENT, EAST TENNESSEE STATE UNIVERSITY.
C
      COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD, ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11), ORMODI(36,12,8)
> , VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
      COMMON /INGDOS/LAMW,LAMS,TSUBB,P,BSUBV,DR,RATUA
      COMMON /NCOM/ NOML(11),NRML(11)
      COMMON /RVAL/ S1,S3,SD1,SD3,ACN,GCN,SW1,SW3
      COMMON /TCOM/ KIQ(36,20,20)

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```
COMMON /PCOM/ REL(6,36),IDIST(20),NUMST
COMMON /FCOM/ FEQWL,INTPA(20,20)
COMMON /OCOMCHAR/NAMNUC(36),WORD
```

C

```
DIMENSION VAGAC(36),VAGCON(36),BAGAC(36),BAGCON(36)
DIMENSION FING(36,20,20),GBUP(36,20,20)
DIMENSION GI(36,4),PARSIZ(36),CLASS(36)
DIMENSION GFIN(36,20,20),CEXP(4,36)
REAL KIQ
CHARACTER*36 DATE_AND_TIME
CHARACTER*8 NADRN, NAMES(11)
CHARACTER*8 NAMNUC,WORD,NADEC1,NADEC3,NAME(11),NAMORG(11)
REAL CFINGA(11),CFINHA(11),DOSING(11),FROG(11),INTPA,
> LAMH20,LAMSUR,MSUBB,LAMRR,INTFC(20,20),DCC14(11),DOSIN(11,36),
> VEGDOS(11),BEFDOS(11),MLKDOS(11),LAMI,LAMW,LAMS,LEFDOS,MAGAC(36),
> MAGCON(36)
```

C** NEW ARRAYS ADDED MAY 1988 FOR VARYING EQUILIBRIUM FRACTIONS

```
REAL CALC_EQUIL_FRACTIONS(20),NEWWAL(20,20)
INTEGER NOBCT(20,20),NOMCT(20,20),TNOBCT,TNOMCT
INTEGER CLASS
INTEGER*2 RNPTR
LOGICAL RNFLAG
DATA RNFLAG/.FALSE./,RNPTR/0/
```

```
DATA NAME/'TOT.BODY','R MAR ','LUNGS ','ENDOST ','S WALL ',
> 'LLI WALL','THYROID ','LIVER ','KIDNEYS ','TESTES ',
> 'OVARIES '/
DATA NADRN/'RN-222 '/
DATA NADEC1/'H-3 '/,NADEC3/'C-14 '/
DATA DCC14/1.16E3,2.03E3,5.07E2,1.85E3,7.43E2,8.92E2,5.27E2,
> 7.30E2,6.49E2,4.46E2,4.46E2/,CEXP/144*0./,GI/144*0./
DATA DOSIN/396*0.0/,GBUP/14400*0.0/,FING/14400*0.0/
```

C---END OF DECLARATIONS

```
DO 5 I=1,11
```

```
5 NAMES(I)=NAME(I)
```

```
READ(50,9061)LIPO
READ(50,9061)NNTB,NRTB,NSTB,NTTB,NUTB,NVTB
READ(50,9062)((NOBCT(I,J),J=1,20),I=1,20)
READ(50,9063)((NOMCT(I,J),J=1,20),I=1,20)
READ(50,9064)((INTFC(I,J),J=1,20),I=1,20)
READ(50,9065)((INTPA(I,J),J=1,20),I=1,20)
READ(50,9067)IMPFIX
READ(50,9068)RVEG,F3VEGM,RBEF,F3BEFM,RMLK,F3MLKM
READ(50,9069)BRTHRT,DILFAC,USEFAC,T,DD1
```

C READ PARAMETERS FOR NRC MODEL

```
READ(50,9000)TSUBH1,TSUBH2,TSUBH3,TSUBH4
```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

READ(50,9000)LAMW
READ(50,9000)TSUBE1,TSUBE2
READ(50,9000)YSUBV1,YSUBV2
READ(50,9000)FSUBP
READ(50,9000)FSUBS
READ(50,9000)QSUBF
READ(50,9000)TSUBF
READ(50,9000)UV,UM,UF,UL
READ(50,9000)TSUBS
READ(50,9000)FSUBG,FSUBL
READ(50,9000)TSUBB
READ(50,9000)P
READ(50,9070)TAUBEF,MSUBB,VSUBM
TAUCM=UM/365.
TAUBM=UF/365.
V=(UL+UV)/365.
A=(UV+UL)/YSUBV2
READ(50,9070)R1,R2
S10=R2
S30=R1
S1=R2
S3=R1
WRITE(51,90011) DATE_AND_TIME
WRITE(51,9001)
IF (LIPO.EQ.1) WRITE(51,9003)
IF (LIPO.EQ.0) WRITE(51,9002)
WRITE(51,9004)
WRITE(51,90004)
IF (NUTB.NE.0) THEN
    WRITE(51,9009)
    WRITE(51,90009)
ENDIF
IF (NVTB.NE.0) WRITE(51,19010)
WRITE(51,90011) DATE_AND_TIME
WRITE(51,9079)
WRITE(51,9080)NNUCS
WRITE(51,9012)TSUBH1
WRITE(51,9013)TSUBH2
WRITE(51,9014)TSUBH3
WRITE(51,9015)TSUBH4
WRITE(51,9016)
WRITE(51,90116)LAMW
WRITE(51,9017)TSUBE1
WRITE(51,9018)
WRITE(51,90118)TSUBE2
WRITE(51,9019)

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
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```

WRITE(51,90119)YSUBV1
WRITE(51,9020)
WRITE(51,90220)YSUBV2
WRITE(51,9021)FSUBP
WRITE(51,9022)
WRITE(51,90222)FSUBS
WRITE(51,9023)
WRITE(51,90223)QSUBF
WRITE(51,9024)TSUBF
WRITE(51,9025)UV
WRITE(51,9026)UM
WRITE(51,9027)UF
WRITE(51,9028)UL
WRITE(51,9029)
WRITE(51,90229)TSUBS
WRITE(51,9030)FSUBG
WRITE(51,9031)FSUBL
WRITE(51,9011)TSUBB
WRITE(51,9010)
WRITE(51,90110)P
WRITE(51,9081)
WRITE(51,90881)RVEG
WRITE(51,9082)
WRITE(51,90882)RBEF
WRITE(51,9083)
WRITE(51,90883)RMLK
WRITE(51,9072)
IF (IMPFIX.EQ.0) THEN
    WRITE(51,9085)
    WRITE(51,90885)
ELSE
    WRITE(51,9084)
    WRITE(51,90884)
ENDIF
120 WRITE(51,9086)F3VEGM
    WRITE(51,9087)F3BEFM
    WRITE(51,9088)F3MLKM
    WRITE(51,9089)BRTHRT
    WRITE(51,9090)
    WRITE(51,90990)T
    WRITE(51,9091)DILFAC
    WRITE(51,9092)USEFAC
    WRITE(51,9093)MSUBB
    WRITE(51,9096)TAUBEF
    WRITE(51,9097)VSUBM
    WRITE(51,9094)S1

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
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```

WRITE(51,9095)S3
WRITE(51,9098)
WRITE(51,90998)DD1
TPOP=0
TNOBCT=0
TNOMCT=0
TARFC=0
DO 140 NR=NRL,NRU
    DO 130 NO=NOL,NOU
        TPOP=INTPA(NO,NR)+TPOP
        TNOBCT=NOBCT(NO,NR)+TNOBCT
        TNOMCT=NOMCT(NO,NR)+TNOMCT
130     TARFC=INTFC(NO,NR)+TARFC
140     CONTINUE
ANUMM=TARFC/A
TKGBCA=TAUBM*365.*TPOP
ANOBCT=TNOBCT
TKGBPA=ANOBCT*TAUBEF*365.*MSUBB
CONMK=TAUCM*TPOP
ANOMCT=TNOMCT
PRNMK=VSUBM*ANOMCT
YCONMK=CONMK*365.
YPRNMK=PRNMK*365.
PFCY=YSUBV2*TARFC
CFCY=TPOP*V*365.

```

```

C*** CHECK ADDED 8/88 TO STOP DIVIDE BY ZERO ERROR WHEN TPOP = 0.
IF ( ANUMM .GE. TPOP ) THEN
    AF = 1.0
ELSE
    AF=ANUMM/TPOP
ENDIF

```

```

F3V=F3VEGM
IF ((1.-AF).GE.F3V) F3V=1.-AF
IF (IMPFIX.EQ.1) F3V=F3VEGM
F1V=RVEG*(1.-F3V)
F2V=1.-F3V-F1V

```

```

C*** DIVIDE BY ZERO CHECK ADDED 8/88
IF ( TKGBPA .GE. TKGBCA ) THEN
    BF = 1.0
ELSE
    BF=TKGBPA/TKGBCA
ENDIF

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```
F3B=F3BEFM
IF ((1.-BF).GE.F3B) F3B=1.-BF
IF (IMPFIX.EQ.1) F3B=F3BEFM
F1B=RBEF*(1.-F3B)
F2B=1.-F3B-F1B
```

```
C*** DIVIDE BY ZERO CHECK ADDED 8/88
IF ( PRNMK .GE. CONMK ) THEN
  CF = 1.0
ELSE
  CF=PRNMK/CONMK
ENDIF
```

```
F3M=F3MLKM
IF ((1.-CF).GE.F3M) F3M=1.-CF
IF (IMPFIX.EQ.1) F3M=F3MLKM
F1M=RMLK*(1.-F3M)
F2M=1.-F3M-F1M
WRITE(51,90011) DATE_AND_TIME
WRITE(51,9099)
WRITE(51,9100)TPOP
WRITE(51,9101)TNOBCT
WRITE(51,9102)TNOMCT
WRITE(51,9103)TARFC
WRITE(51,9104)TKGBCA
WRITE(51,9105)TKGBPA
WRITE(51,9106)YCONMK
WRITE(51,9107)YPRNMK
WRITE(51,9108)CFCY
WRITE(51,9109)PFCY
IF (NVTB.NE.0) READ(50,9139)NAMES
DO 680 I = 1, NNUCS
  IF ((NAMNUC(I) .EQ. NADRN ) .AND. ( .NOT. RNFLAG ) ) THEN
    RNFLAG = .TRUE.
    RNPTR = I
  ENDIF
  READ(50,9110)NUMORG,LAMRR,CFSBA,CFSBW,CFSUR,KFLAG,TDCF,TDCW
  READ(50,9111)(FROG(IM),IM=1,11)
  READ(50,9000)FSUBMI,FSUBFI,BSUBV1,BSUBV2
  READ(50,9112)LAMSUR,LAMH20,IFLAG,RD1,RD2,RW1,RW2
  READ(50,9032)I1,I2,I3,I4,I5,F1,F2,F3,F4,F5
  LAMI = LAMRR/24.
  LAMS = LAMSUR/24.
```

```
C IFLAG=1 IF SPECIAL VALUES USED FOR R1 AND R2
C IFLAG=2 IF R1 AND R2 ARE GIVEN FOR DRY AND WET DEPOSITION
SD3=RD1
```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

      SD1=RD2
      SW3=RW1
      SW1=RW2
C READ INHALATION DOSE CONVERSION FACTORS
C HEADER CARD GIVES SOLUBILITY, PARTICLE SIZE, AND G.I. UPTAKE FRACTION
      READ(50,9033)ISOL,AMAD,FLINH
      DO 150 J=1,NUMORG
        READ(50,9034)NAMORG(J),CFINHA(J)
150      CONTINUE
C READ INGESTION DOSE CONVERSION FACTORS
C HEADER CARD GIVES G.I. UPTAKE FRACTION
      READ(50,9035)FLING
      DO 160 J=1,NUMORG
        READ(50,9035)CFINGA(J)
160      CONTINUE
      CLASS(I)=ISOL
      PARSIZ(I)=AMAD
      GI(I,1)=FLINH
      GI(I,2)=FLING
      IF (I1.NE.0) THEN
        IF (I2.EQ.0) I2=1
        IF (I3.EQ.0) I3=1
        IF (I4.EQ.0) I4=1
        IF (I5.EQ.0) I5=1
      ENDIF
      IF (I.LE.NNTB) THEN
        WRITE(51,9113)NAMNUC(I)
        WRITE(51,9072)
        WRITE(51,9114)
        WRITE(51,9115)
        WRITE(51,9072)
        WRITE(51,9116)
        WRITE(51,9117)
        WRITE(51,9072)
      ENDIF
180      VAGCON(I)=0.
      BAGCON(I)=0.
      MAGCON(I)=0.
      VAGAC(I)=0.
      BAGAC(I)=0.
      MAGAC(I)=0.
      IF (I1.EQ.0) THEN
        DO 200 NR=NRL,NRU
          DO 190 NO=NOL,NOU
            VAGCON(I)=INTFC(NO,NR)*GCON(I,NO,NR)+VAGCON(I)
            BAGCON(I)=NOBCT(NO,NR)*GCON(I,NO,NR)+BAGCON(I)
          
```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

                MAGCON(I)=NOMCT(NO,NR)*GCON(I,NO,NR)+MAGCON(I)
                VAGAC(I)=INTFC(NO,NR)*ACON(I,NO,NR)+VAGAC(I)
                BAGAC(I)=NOBCT(NO,NR)*ACON(I,NO,NR)+BAGAC(I)
                MAGAC(I)=NOMCT(NO,NR)*ACON(I,NO,NR)+MAGAC(I)
190             CONTINUE
200             CONTINUE
                VAGCON(I)=VAGCON(I)/TARFC
                BAGCON(I)=BAGCON(I)/ANOBCT
                MAGCON(I)=MAGCON(I)/ANOMCT
                VAGAC(I)=VAGAC(I)/TARFC
                BAGAC(I)=BAGAC(I)/ANOBCT
                MAGAC(I)=MAGAC(I)/ANOMCT
                ELSE
210             IF (REL(1,I).EQ.0.) THEN
                DO 230 NR=NRL,NRU
                    DO 220 NO=NOL,NOU
                        GCI=F1*GCON(I1,NO,NR)+F2*GCON(I2,NO,NR)+F3*GCON(I3,NO,NR)
>                     + F4*GCON(I4,NO,NR)+F5*GCON(I5,NO,NR)
                        VAGCON(I)=INTFC(NO,NR)*GCI+VAGCON(I)
                        BAGCON(I)=NOBCT(NO,NR)*GCI+BAGCON(I)
                        MAGCON(I)=NOMCT(NO,NR)*GCI+MAGCON(I)
220                     CONTINUE
230                     CONTINUE
                        VAGCON(I)=VAGCON(I)/TARFC
                        BAGCON(I)=BAGCON(I)/ANOBCT
                        MAGCON(I)=MAGCON(I)/ANOMCT
                        ELSE
240                     MODE=1
                        BSUBV=BSUBV2
                        TSUBE=TSUBE2
                        YSUBV=YSUBV2
                        TSUBH=TSUBH4
                        DR=DD1
                        DO 260 NR=NRL,NRU
                            DO 250 NO=NOL,NOU
                                GCN=GCON(I,NO,NR)
                                ACN=ACON(I,NO,NR)
                                CALL RVALUE(IFLAG,MODE,I,NO,NR,R)
                                A=CV(I,LAMI,1.,1.,TSUBE,YSUBV,TSUBH,R)
                                GCI=F1*GCON(I1,NO,NR)+F2*GCON(I2,NO,NR)+F3*GCON(I3,NO,NR)
>                                 + F4*GCON(I4,NO,NR)+F5*GCON(I5,NO,NR)
                                GFA=GCON(I,NO,NR)+RATUA*GCI
                                VAGCON(I)=INTFC(NO,NR)*GFA+VAGCON(I)
250                             CONTINUE
260                             CONTINUE
                                VAGCON(I)=VAGCON(I)/TARFC

```


AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

MODE=2
DR=1.
TSUBE=TSUBE1
YSUBV=YSUBV1
BSUBV=BSUBV1
TSUBH=TSUBH1
DO 280 NR=NRL,NRU
  DO 270 NO=NOL,NOU
    GCN=GCON(I,NO,NR)
    ACN=ACON(I,NO,NR)
    CALL RVALUE(IFLAG,MODE,I,NO,NR,R)
    A=CV(I,LAMI,1.,1.,TSUBE,YSUBV,TSUBH,R)
    GCI=F1*GCON(I1,NO,NR)+F2*GCON(I2,NO,NR)+F3*GCON(I3,NO,NR)
    + F4*GCON(I4,NO,NR)+F5*GCON(I5,NO,NR)
    GFA=GCON(I,NO,NR)+RATUA*GCI
    BAGCON(I)=NOBCT(NO,NR)*GFA+BAGCON(I)
    MAGCON(I)=NOMCT(NO,NR)*GFA+MAGCON(I)
270    CONTINUE
280    CONTINUE
    BAGCON(I)=BAGCON(I)/ANOBCT
    MAGCON(I)=MAGCON(I)/ANOMCT
    ENDIF
    ENDIF
    IF (NAMNUC(I) .EQ. NADEC1) THEN
      NTRIT = 1
    ELSE
      NTRIT = 0
    ENDIF
    DO 560 NO=NOL,NOU
      DO 550 NR=NRL,NRU
        GCI=0
        IF (I1.NE.0) THEN
          GCI=F1*GCON(I1,NO,NR)+F2*GCON(I2,NO,NR)+F3*GCON(I3,NO,NR)
          + F4*GCON(I4,NO,NR)+F5*GCON(I5,NO,NR)
        ENDIF
        GCN=GCON(I,NO,NR)+GCI
        ACN=ACON(I,NO,NR)
        IF (I1.EQ.0) THEN
          D1=1.
          D2=1.
          D3=1.
          D4=1.
          IF (GCON(I,NO,NR).NE.0.) THEN
            D4=F1M+F2M*(MAGCON(I)/GCON(I,NO,NR))
            D3=F1B+F2B*(BAGCON(I)/GCON(I,NO,NR))
            D2=F1V+F2V*(VAGCON(I)/GCON(I,NO,NR))

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

      D1=D2
    ELSE
      IF (REL(1,I).EQ.0.) THEN
        D4=F1M+F2M*(MAGCON(I)/GCI)
        D3=F1B+F2B*(BAGCON(I)/GCI)
        D2=F1V+F2V*(VAGCON(I)/GCI)
        D1=D2
      ENDIF
    ENDIF
  ELSE
    IF (REL(1,I).EQ.0.) THEN
      D4=F1M+F2M*(MAGCON(I)/GCI)
      D3=F1B+F2B*(BAGCON(I)/GCI)
      D2=F1V+F2V*(VAGCON(I)/GCI)
      D1=D2
    ENDIF
  ENDIF
DO 540 J=1,11
370  X=LAMRR+LAMSUR
    IF (KFLAG.EQ.1) X=ANLAM(I)+LAMSUR
    DO 380 N=1,NUMORG
      IF (NAMES(J) .EQ. NAMORG(N)) THEN
        L=N
      ELSE
        L=1
      ENDIF
380  CONTINUE
C  INHALATION DOSE CALCULATIONS
400  CFINH=CFINHA(L)
    CFING=CFINGA(L)
    IF (ACN.EQ.0) DOS1=0
    IF (ACN.EQ.0) DOS2=0
    IF (ACN.NE.0.) THEN
      DOS1=ACN*1.E-6*BRTHRT*8760.*CFINH
C  AIR SUBMERSION DOSE CALCULATIONS
      DOS2=ACN*1.E-6*8760.*CFSBA*FROG(J)
    ENDIF
C  SURFACE EXPOSURE DOSE CALCULATIONS
410  ALT=X*T
    IF (ALT.GT.0.03) THEN
      DOS3=GCN*1.E-6*8760.*CFSUR*FROG(J)*(1-EXP(-X*T))/X*
        > 3600.*24.
      GBUP(I,NO,NR)=GCN*1.E-8*24.*3600.*(1.-EXP(-X*T))/X
    ELSE
      DOS3=GCN*1.E-6*8760.*CFSUR*FROG(J)*((0.1666667*ALT-
        > 0.5)*ALT+T) *3600.*24.

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

>          GBUP(I,NO,NR)-GCN*1.E-8*24.*3600.* ((0.1666667*ALT-
          0.5)*ALT+T)
          ENDIF
C  INGESTION DOSE CALCULATIONS
430          IF (NTRIT.NE.1.AND.NAMNUC(I).NE.NADEC3) GO TO 450
          IF (NTRIT.NE.1) GO TO 440
C  INGESTION DOSE CALCULATIONS FOR H-3
          VEGDOS(J)=(F1V*ACN+F2V*VAGAC(I))*TDCF*.505
          BEFDOS(J)=(F1B*ACN+F2B*BAGAC(I))*TDCF*.185
          MLKDOS(J)=(F1M*ACN+F2M*MAGAC(I))*TDCF*.310
          DOSING(J)=VEGDOS(J)+BEFDOS(J)+MLKDOS(J)+ACN*TDCW
          KIQ(I,NO,NR)=(((F1V*ACN+F2V*VAGAC(I))*1.E6)/8.)*1560.*
          .505*365.+(((ACN*1.E6)/8.)*1440.*365.)*(TDCW/5.70)
          GFIN(I,NO,NR)=(((F1B*ACN+F2B*BAGAC(I))*1.E6)/8.)*1560.
          *.185*365.
          FING(I,NO,NR)=(((F1M*ACN+F2M*MAGAC(I))*1.E6)/8.)*1560.
          *.310*365.
          TDCWB=TDCW
          GO TO 480
440          CONTINUE
C  INGESTION DOSE CALCULATIONS FOR C-14
          WTCV=79.96*V
          WTCB=238.16*TAUBM
          WTCM=68.9*TAUCM
          WTF=WTCV+WTCB+WTCM
          DOSING(J)=(DCC14(J)/WTF)*(WTCV*(F1V*ACN+F2V*VAGAC(I))+
          WTCB*(F1B*ACN+F2B*BAGAC(I))+WTCM*(F1M*ACN+F2M*
          MAGAC(I)))
          VEGDOS(J)=(DCC14(J)/WTF)*(WTCV*(F1V*ACN+F2V*VAGAC(I)))
          BEFDOS(J)=(DCC14(J)/WTF)*(WTCV*(F1B*ACN+F2B*BAGAC(I)))
          MLKDOS(J)=(DCC14(J)/WTF)*(WTCV*(F1M*ACN+F2M*MAGAC(I)))
          KIQ(I,NO,NR)=((F1V*ACN+F2V*VAGAC(I))/1.8E-7)*WTCV*365.
          GFIN(I,NO,NR)=((F1B*ACN+F2B*BAGAC(I))/1.8E-7)*WTCB*365
          FING(I,NO,NR)=((F1M*ACN+F2M*MAGAC(I))/1.8E-7)*WTCM*365
          GO TO 480
C  INGESTION DOSES DEFINED AS ZERO IF GROUND CONCENTRATION IS ZERO
450          IF (GCN.NE.0) GO TO 460
          DOSING(J)=0.
          VEGDOS(J)=0.
          BEFDOS(J)=0.
          MLKDOS(J)=0.
          KIQ(I,NO,NR)=0.
          GFIN(I,NO,NR)=0.
          FING(I,NO,NR)=0.

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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      GO TO 480
C INGESTION DOSE CALCULATIONS USING NRC MODEL
C CALCULATE CIV=CONCENTRATION OF RADIONUCLIDE IN THE ANIMAL'S FEED USING
C SLIGHTLY SIMPLIFIED FORM OF EQ C-11, REG GUIDE 1.109.27.
C CIV= FSUBP*FSUBS*(CONC. OF NUCLIDE ON PASTURE GRASS)
C      + (1.0-FSUBP*FSUBS)*(CONC. OF NUCLIDE IN STORED FEEDS)
C USE PARAMETERS FOR GRASS-COW-MILK-MAN-PATHWAY
C FIRST TERM.. USE TSUBH VALUE FOR INGESTION BY ANIMALS OF PASTURE GRAS
C THE DEPOSITION RATE GCN IS IN UNITS OF PCI/SQUARE CM-SEC.
C TO CONVERT TO PCI/SQUARE METER-HR,MULTIPLY BY 3.6E7.
460      DEPRAT= GCN*3.6E7
      GCRU=GCON(I,NO,NR)*3.6E7
      GCN=GCRU/3.6E7
      TSUBH=TSUBH1
      TSUBE=TSUBE1
      YSUBV=YSUBV1
      BSUBV=BSUBV1
C LAMI IS THE RADIOACTIVE DECAY CONSTANT OF NUCLIDE I, IN HR**-1.
      LAMI = LAMRR/24.
      MODE=2
      CALL RVALUE(IFLAG,MODE,I,NO,NR,R)
      DR=1.
      TERM1=FSUBP*FSUBS *CV(I,LAMI,DEPRAT,GCRU,TSUBE,YSUBV,
      >      TSUBH,R)
C SECOND TERM.. USE TSUBH VALUE FOR INGESTION BY ANIMALS OF STORED FEED
      TSUBH=TSUBH2
      TERM2=(1.0-FSUBP*FSUBS)*CV(I,LAMI,DEPRAT,GCRU,TSUBE,
      >      YSUBV,TSUBH,R)
      CIV=TERM1 + TERM2

C
C CALCULATE CIM=NUCLIDE CONCENTRATION IN MILK USING EQ C-10, REG GUIDE
C 1.109-27
      CIM=FSUBMI*CIV*QSUBF*EXP(-LAMRR*TSUBF)
C DFIJ IS THE DOSE CONVERSION FACTOR FOR THE INGESTION OF NUCLIDE I, ORG
C IN MREM/PCI.
      DFIJ = 0.001*CFING
C CALCULATE MLKDOS(J)-ANNUAL DOSE TO ORGAN J FROM INGESTION OF RADIONUCL
C IN MILK USING EQ C-13, REG GUIDE 1.109-28.
      IF(I1.EQ.0.OR.REL(1,I).EQ.0..OR.RATUA.EQ.0.) GO TO 462
      D4 = F1M+F2M*(MAGCON(I)/(GCON(I,NO,NR)+RATUA*GCI))
      D3 = F1B+F2B*(BAGCON(I)/(GCON(I,NO,NR)+RATUA*GCI))
462      MLKDOS(J)=DFIJ*UM*CIM*D4
C THE NRC MODEL GIVES DOSES IN MREM/YR. TO CONVERT TO REM/YR,
C MULTIPLY BY 0.001
      MLKDOS(J) = MLKDOS(J)*.001
C CALCULATE CIF=NUCLIDE CONCENTRATION IN MEAT USING EQ C-12, REG GUIDE 1

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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CIF=FSUBFI*CIV*QSUBF*EXP(-LAMRR *TSUBS)
C CALCULATE BEFDOS(J)=ANNUAL DOSE TO ORGAN J FROM INGESTION OF
C RADIONUCLIDE I IN MEAT. (REG GUIDE 1.109-28, EQ C-13)
    BEFDOS(J)=DFIJ*UF*CIF*D3
    BEFDOS(J) = BEFDOS(J) *.001
C CALCULATE CIVP=CONCENTRATION OF RADIONUCLIDE IN PRODUCE CONSUMED BY MA
C USE PARAMETERS FOR CROP/VEGETATION-MAN PATHWAY., TSBH VALUE FOR PRODU
    TSUBE= TSUBE2
    YSUBV= YSUBV2
    TSUBH= TSUBH4
    BSUBV=BSUBV2
    DR=DD1
    MODE=1
    CALL RVALUE(IFLAG,MODE,I,NO,NR,R)
    CIVP=CV(I,LAMI,DEPRAT,GCRU,TSUBE,YSUBV,TSUBH,R)
C CALCULATE PRODOS=ANNUAL DOSE TO ORGAN J FROM INGESTION BY MAN OF RADIO
C IN PRODUCE. (REG GUIDE 1.109-28, EQ C-13)
    IF(I1.EQ.0.OR.REL(1,I).EQ.0..OR.RATUA.EQ.0.) GO TO 464
    D2 = F1V+F2V*(VAGCON(I)/(GCON(I,NO,NR)+RATUA*GCI))
464    D1=D2
    PRODOS=DFIJ*UV*FSUBG*CIVP*D2
C CALCULATE CIVL=CONCENTRATION OF RADIONUCLIDE IN LEAFY VEGETABLES.
C USE PARAMETERS FOR CROP/VEGETATION-MAN PATHWAY.
C THE TSBH VALUE IS FOR LEAFY VEGETABLES.
    TSUBE=TSUBE2
    YSUBV=YSUBV2
    TSUBH=TSUBH3
    BSUBV=BSUBV2
    DR=DD1
    CIVL=CV(I,LAMI,DEPRAT,GCRU,TSUBE,YSUBV,TSUBH,R)
C CALCULATE LEFDOS=ANNUAL DOSE TO ORGAN J FROM INGESTION OF RADIONUCLIDE
C IN LEAFY VEGETABLES. (REG GUIDE 1.109-28, EQ C-13)
    LEFDOS=DFIJ*UL*FSUBL*CIVL*D1
C VEGDOS(J) IS THE ANNUAL DOSE TO ORGAN J FROM INGESTION OF RADIONUCLIDE
C IN PRODUCE AND LEAFY VEGETABLES.
    VEGDOS(J)=PRODOS + LEFDOS
    VEGDOS(J) = VEGDOS(J)*.001
    DOSING(J)=BEFDOS(J) + MLKDOS(J) + VEGDOS(J)
    IF (J.NE.11) GO TO 470
    KIQ(I,NO,NR)=UL*FSUBL*CIVL*D1+UV*FSUBG*CIVP*D2
    GFIN(I,NO,NR)=UF*CIF*D3
    FING(I,NO,NR)=UM*CIM*D4
470    GCN=DEPRAT/3.6E7
C WATER SUBMERSION DOSE CALCULATIONS
480    X=LAMRR+LAMH2O
    IF (KFLAG.EQ.1) X=ANLAM(I)+LAMH2O

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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                IF (GCN.NE.0) THEN
                  ALT=X*T
                  IF (ALT.GT.0.03) THEN
                    DOS5=GCN*1.E-6*8760.*CFSBW*FROG(J)*USEFAC
>                  /DILFAC*(1-EXP(-X*T))/X *3600.*24.
                  ELSE
                    DOS5=GCN*1.E-6*8760.*CFSBW*FROG(J)*USEFAC
>                  /DILFAC*((0.1666667* ALT-0.5)*ALT+T)*3600.*24.
                  ENDIF
                ELSE
                  DOS5=0
                ENDIF
510      TDOS=DOS1+DOS2+DOS3+DOSING(J)+DOS5
                IF (I.LE.NNTB) THEN
>                  WRITE(51,9118)NO,NR,NAMES(J),DOS1,DOS2,DOS3,
>                  DOSING(J),DOS5,TDOS
                ENDIF
                IF (LIPO.EQ.1) THEN
C POPULATION DOSE CALCULATIONS
                  ORMODI(I,J,1)=DOS1*INTPA(NO,NR)+ORMODI(I,J,1)
                  ORMODI(I,J,2)=DOS2*INTPA(NO,NR)+ORMODI(I,J,2)
                  ORMODI(I,J,3)=DOS3*INTPA(NO,NR)+ORMODI(I,J,3)
                  ORMODI(I,J,4)=DOSING(J)*INTPA(NO,NR)+ORMODI(I,J,4)
                  ORMODI(I,J,5)=DOS5*INTPA(NO,NR)+ORMODI(I,J,5)
                  ORMODI(I,J,6)=VEGDOS(J)*INTPA(NO,NR)+ORMODI(I,J,6)
                  ORMODI(I,J,7)=BEFDOS(J)*INTPA(NO,NR)+ORMODI(I,J,7)
                  ORMODI(I,J,8)=MLKDOS(J)*INTPA(NO,NR)+ORMODI(I,J,8)
C CALCULATIONS OF THE HIGHEST INDIVIDUAL DOSE FOR EACH RADIONUCLIDE
C AND ORGAN AND GRID LOCATION WHERE RECEIVED
                  ELSE
530      IF (TDOS.GT.DOSIN(J,I)) THEN
>                  NOMM(I,J)=NO
>                  NRMM(I,J)=NR
>                  ORMODI(I,J,1)=DOS1
>                  ORMODI(I,J,2)=DOS2
>                  ORMODI(I,J,3)=DOS3
>                  ORMODI(I,J,4)=DOSING(J)
>                  ORMODI(I,J,5)=DOS5
>                  ORMODI(I,J,6)=VEGDOS(J)
>                  ORMODI(I,J,7)=BEFDOS(J)
>                  ORMODI(I,J,8)=MLKDOS(J)
>                  DOSIN(J,I)=TDOS
>
>                  ENDIF
>                ENDIF
540      CONTINUE
550      CONTINUE

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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560      CONTINUE
570      CONTINUE
580      WRITE(51,90011) DATE_AND_TIME
        WRITE(51,9119)NAMNUC(I)
        IF (IFLAG.GT.2.OR.IFLAG.LT.0) PRINT 9120
590      IF (IFLAG.EQ.1) THEN
          WRITE(51,9121)SD1
          WRITE(51,9122)SD3
        ENDIF
600      IF (IFLAG.EQ.2) THEN
          WRITE(51,9123)SD1
          WRITE(51,9124)SW1
          WRITE(51,9125)SD3
          WRITE(51,9126)SW3
        ENDIF
610      WRITE(51,9127)LAMRR
        IF (KFLAG.EQ.1) THEN
          WRITE(51,9128)
          WRITE(51,9129)
        ENDIF
620      WRITE(51,9130)LAMSUR
        WRITE(51,9131)LAMH2O
        IF (NTRIT.EQ.1) THEN
          WRITE(51,9132)TDCF
          WRITE(51,9133)TDCW
630      ELSE
          WRITE(51,9036)
          WRITE(51,90336) FSUBMI
          WRITE(51,9037)
          WRITE(51,90337) FSUBFI
          WRITE(51,9038)
          WRITE(51,90338) BSUBV1
          WRITE(51,9039)
          WRITE(51,9040)
          WRITE(51,90440) BSUBV2
          WRITE(51,9041)
          WRITE(51,9042)F1INH
          WRITE(51,9043)F1ING
          WRITE(51,9044)AMAD
          WRITE(51,9045)ISOL
          IF (I1.NE.0) THEN
            WRITE(51,9046)
            WRITE(51,9047)
            WRITE(51,9048)
            WRITE(51,9049)NAMNUC(I1),F1
            IF (F2.NE.0.) WRITE(51,9050)NAMNUC(I2),F2
          
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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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                IF (F3.NE.0.) WRITE(51,9050)NAMNUC(I3),F3
                IF (F4.NE.0.) WRITE(51,9050)NAMNUC(I4),F4
                IF (F5.NE.0.) WRITE(51,9050)NAMNUC(I5),F5
            ENDIF
        ENDIF
        WRITE(51,9072)
        DO 670 J=1,NUMORG
            DO 660 K=1,11
                IF (NAMORG(J).EQ.NAMES(K)) THEN
                    CASBA=CFSBA*FROG(K)
                    CASUR=CFSUR*FROG(K)
                    CASBW=CFSBW*FROG(K)
                ENDIF
            CONTINUE
        CONTINUE
    CONTINUE
C START OF MAXIMIZING CALCULATIONS FOR THE INDIVIDUAL DOSE OPTION
    IF (LIPO.EQ.0) THEN
        DO 840 J=1,11
            ADSE=0
            DO 750 NO=NOL,NOU
                DO 740 NR=NRL,NRU
                    DSE=0
                    AKR=0
                    BKR=0
                    DKR=0
                    EKR=0
                    VEG=0
                    BEF=0
                    AME=0
                    DO 730 I=1,NNUCS
                        AC=ACON(I,NOMM(I,J),NRMM(I,J))
                        IF (AC.EQ.0.) GO TO 690
                        AKR=ORMODI(I,J,1)/AC*ACON(I,NO,NR)+AKR
                        BKR=ORMODI(I,J,2)/AC*ACON(I,NO,NR)+BKR
690                     BC=GBUP(I,NOMM(I,J),NRMM(I,J))
                        IF (BC.EQ.0) GO TO 700
                        DKR=ORMODI(I,J,3)/BC*GBUP(I,NO,NR)+DKR
                        EKR=ORMODI(I,J,5)/BC*GBUP(I,NO,NR)+EKR
700                     IF (NAMNUC(I).EQ.NADEC1.OR.NAMNUC(I).EQ.NADEC3) GO TO
>                        710
                        IF (BC.EQ.0) GO TO 720
                        VEG=ORMODI(I,J,6)*(KIQ(I,NO,NR)/(KIQ(I,NOMM(I,J),
>                        NRMM(I,J))+1.E-60))+VEG
                        BEF=ORMODI(I,J,7)*(GFIN(I,NO,NR)/(GFIN(I,NOMM(I,J),
>                        NRMM(I,J))+1.E-60))+BEF

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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0          1          2          3          4          5          6          7
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>          AME=ORMODI(I,J,8)*(FING(I,NO,NR)/(FING(I,NOMM(I,J),
>          NRMM(I,J))+1.E-60))+AME
>          GO TO 720
710        ACO=ACON(I,NO,NR)
>          VEG=((F1V*ACO+F2V*VAGAC(I))/(F1V*AC+F2V*VAGAC(I)+1.E-
>          60))*ORMODI(I,J,6)+VEG
>          BEF=((F1B*ACO+F2B*BAGAC(I))/(F1B*AC+F2B*BAGAC(I)+1.E-
>          60))*ORMODI(I,J,7)+BEF
>          AME=((F1M*ACO+F2M*MAGAC(I))/(F1M*AC+F2M*MAGAC(I)+1.E-
>          60))*ORMODI(I,J,8)+AME
>          IF (NAMNUC(I).EQ.NADEC1) AME=AME+ACO*TDCWB
720        CONTINUE
>          TING=VEG+BEF+AME
730        DSE=AKR+BKR+DKR+EKR+TING
>          IF (DSE.GE.ADSE) THEN
>            ADSE=DSE
>            NOML(J)=NO
>            NRML(J)=NR
>          ENDIF
740        CONTINUE
750        CONTINUE
>          NO=NOML(J)
>          NR=NRML(J)
>          DO 830 I=1,NNUCS
>            AC=ACON(I,NOMM(I,J),NRMM(I,J))
>            IF(AC.NE.0.) THEN
>              ACI=ACON(I,NO,NR)
>              IF (ACI.NE.0.) THEN
>                ORMODI(I,J,1)=ORMODI(I,J,1)/AC*ACI
>                ORMODI(I,J,2)=ORMODI(I,J,2)/AC*ACI
>              ELSE
>                ORMODI(I,J,1)=0.
>                ORMODI(I,J,2)=0.
>              ENDIF
>            ELSE
>              ORMODI(I,J,1)=0.
>              ORMODI(I,J,2)=0.
>            ENDIF
>          ENDIF
770        BC=GBUP(I,NOMM(I,J),NRMM(I,J))
>          IF(BC.EQ.0.) THEN
>            ORMODI(I,J,3)=0
>            ORMODI(I,J,5)=0
>          ELSE
>            BCI=GBUP(I,NO,NR)
>            IF (BCI.EQ.0) THEN
>              ORMODI(I,J,3)=0

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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0          1          2          3          4          5          6          7
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      ORMODI(I,J,5)=0
      ELSE
      ORMODI(I,J,3)=ORMODI(I,J,3)/BC*BCI
      ORMODI(I,J,5)=ORMODI(I,J,5)/BC*BCI
      ENDIF
      ENDIF
790      IF (NAMNUC(I).EQ.NADEC1.OR.NAMNUC(I).EQ.NADEC3) GO TO 810
      IF (BCI.EQ.0) GO TO 800
      ORMODI(I,J,6)=ORMODI(I,J,6)*(KIQ(I,NO,NR)/(KIQ(I,NOMM(I,J),
>      NRMM(I,J))+1.E-60))
      ORMODI(I,J,7)=ORMODI(I,J,7)*(GFIN(I,NO,NR)/(GFIN(I,NOMM(I,J),
>      ,NRMM(I,J))+1.E-60))
      ORMODI(I,J,8)=ORMODI(I,J,8)*(FING(I,NO,NR)/(FING(I,NOMM(I,J),
>      ,NRMM(I,J))+1.E-60))
      GO TO 820
800      ORMODI(I,J,6)=0
      ORMODI(I,J,7)=0
      ORMODI(I,J,8)=0
      GO TO 820
810      CONTINUE
      ORMODI(I,J,6)=((F1V*ACI+F2V*VAGAC(I))/(F1V*AC+F2V*VAGAC(I)+
>      1.E-60))*ORMODI(I,J,6)
      ORMODI(I,J,7)=((F1B*ACI+F2B*BAGAC(I))/(F1B*AC+F2B*BAGAC(I)+
>      1.E-60))*ORMODI(I,J,7)
      ORMODI(I,J,8)=((F1M*ACI+F2M*MAGAC(I))/(F1M*AC+F2M*MAGAC(I)+
>      1.E-60))*ORMODI(I,J,8)
820      ORMODI(I,J,4)=ORMODI(I,J,6)+ORMODI(I,J,7)+ORMODI(I,J,8)
      IF (NAMNUC(I).EQ.NADEC1) ORMODI(I,J,4)=ORMODI(I,J,4)+ACI*
>      TDCWB
830      CONTINUE
840      CONTINUE
C END OF MAXIMIZING CALCULATIONS FOR THE INDIVIDUAL DOSE OPTION
      ENDIF

C***  CALCULATE VARYING EQUILIBRIUM FRACTIONS..NO LONGER CONSTANT OF .7
C****  CHANGED MAY 1988
C***
      IF ( ( RNFLAG ) .AND. ( NUTB .NE. 0 ) ) THEN
      CALL DETERMINE_EQUIL_FRACTIONS(IDIST,CALC_EQUIL_FRACTIONS,
+      NRL,NRU)
      ENDIF
C  OUTPUT FOR HEALTH RISK CALCULATIONS
      DO 970 I=1,NNUCS
      TIME=0
      WRITE(25)NAMNUC(I),PARSIZ(I),CLASS(I),(GI(I,J),J=1,4),TIME,LIPO
      WRITE(25)NOL,NOU,NRL,NRU,(IDIST(IG),IG=NRL,NRU)

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AIRDOS-EPA (AIRDOS2.FOR) Program File
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922  ALIP=LIPO
      DO 960 NO=NOL,NOU
        DO 950 NR=NRL,NRU
          ACUP=ACON(I,NO,NR)*1.E-6*(ALIP*(INTPA(NO,NR)-1.)+1.)
          CEXP(1,I)=CEXP(1,I)+ACUP
          GBIP=GBUP(I,NO,NR)*(ALIP*(INTPA(NO,NR)-1.)+1.)
          CEXP(2,I)=CEXP(2,I)+GBIP
          FIOP=(KIQ(I,NO,NR)+GFIN(I,NO,NR)+FING(I,NO,NR))* (ALIP*
>          (INTPA(NO,NR)-1.)+1.)
          CEXP(3,I)=CEXP(3,I)+FIOP
          FINH=ACON(I,NO,NR)*BRTHRT*8760.*(ALIP*(INTPA(NO,NR)-1.)+
>          1.)
          CEXP(4,I)=CEXP(4,I)+FINH
924  IF (NAMNUC(I).NE.NADRN) THEN
        WRITE(25) ACUP,GBIP,FIOP,FINH
      ELSE
930      NEWWAL(NO,NR) = CALC_EQUIL_FRACTIONS(NR) * 10. *
+      ACON(I,NO,NR) * (ALIP * (INTPA(NO,NR) - 1.) + 1.)

C***  CHECK TO SEE IF POPULATION RUN.. IF INDIVIDUAL OUTPUT GROUND CONCENTRA.
C***  FOR NEW SYNOPSIS REPORT IN DARTAB

C***          IF ( LIPO .EQ. 0 ) THEN
              WRITE(25) CALC_EQUIL_FRACTIONS(NR),NEWWAL(NO,NR),
+              1000*ACON(I,NO,NR)
C***          ELSE
C***          WRITE(25) CALC_EQUIL_FRACTIONS(NR),NEWWAL(NO,NR)
C***          ENDIF

              ENDIF
950      CONTINUE
960      CONTINUE
      IF (LIPO.EQ.1) WRITE(25)INTPA
970      CONTINUE
980  CONTINUE
      IF ((NUTB .NE. 0 ) .AND. ( RNFLAG ) )
+      CALL DOSMIC(CALC_EQUIL_FRACTIONS,NEWWAL,RNPTR,IDIST,NAMES,
+      DATE_AND_TIME)
990  RETURN
9000 FORMAT(8E10.3)
90011 FORMAT('1',T10,'DATE',2X,A)
9001  FORMAT('0',T3,
>  '***OPTIONS SELECTED FOR DOSE AND INTAKE CALCULATIONS***')
9002  FORMAT('0',T11,'CALCULATIONS ARE MADE FOR THE MAXIMALLY-EXPOSED I
>NDIVIDUAL.')
9003  FORMAT('0',T11,'CALCULATIONS ARE MADE FOR THE POPULATION.')

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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9004 FORMAT('0',T11,'TABLES FOR EACH NUCLIDE LISTING DOSES BY ORGAN',
> ' AND PATHWAY')
90004 FORMAT(' ',T11,'AT EACH ENVIRONMENTAL LOCATION ARE OMITTED.')
9009 FORMAT('0',T11,'WORKING LEVELS ARE CALCULATED FOR RN-222 IF')
90009 FORMAT(' ',T11,'IT IS IN THE SOURCE TERM.')
19010 FORMAT('0',T11,'ORGAN NAMES ARE INPUT.')
9010 FORMAT('0',T11,'EFFECTIVE SURFACE DENSITY OF SOIL',
> 'KG/SQ. M, DRY WEIGHT.')
90110 FORMAT(T11,'(ASSUMES 15 CM PLOW LAYER)',T71,E10.2)
9011 FORMAT('0',T6,'PERIOD OF LONG-TERM BUILDUP FOR ',
> 'ACTIVITY IN SOIL (YEARS)',T71,E10.2)
9012 FORMAT('0',T6,'TIME DELAY--INGESTION OF PASTURE GRASS BY ',
> 'ANIMALS (HR)',T71,E10.2)
9013 FORMAT('0',T6,'TIME DELAY--INGESTION OF STORED FEED BY ',
> 'ANIMALS (HR)',T71,E10.2)
9014 FORMAT('0',T6,'TIME DELAY--INGESTION OF LEAFY VEGETABLES ',
> 'BY MAN (HR)',T71,E10.2)
9015 FORMAT('0',T6,'TIME DELAY--INGESTION OF PRODUCE BY ', 'MAN (HR)',
> T71,E10.2)
9016 FORMAT('0',T6,'REMOVAL RATE CONSTANT FOR PHYSICAL LOSS BY')
90116 FORMAT(T11,'WEATHERING (PER HOUR)',T71,E10.2)
9017 FORMAT('0',T6,'PERIOD OF EXPOSURE DURING GROWING SEASON--',
> 'PASTURE GRASS (HR)',T71,E10.2)
9018 FORMAT('0',T6,'PERIOD OF EXPOSURE DURING GROWING SEASON--')
90118 FORMAT(T11,'CROPS OR LEAFY VEGETABLES (HR)',T71,E10.2)
9019 FORMAT('0',T6,'AGRICULTURAL PRODUCTIVITY BY UNIT AREA')
90119 FORMAT(T11,'(GRASS-COW-MILK-MAN PATHWAY (KG/SQ. METER))',
> T71,E10.2)
9020 FORMAT('0',T6,'AGRICULTURAL PRODUCTIVITY BY UNIT AREA')
90220 FORMAT(T11,'(PRODUCE OR LEAFY VEG INGESTED BY MAN (KG/SQ METER))',
> T71,E10.2)
9021 FORMAT('0',T6,'FRACTION OF YEAR ANIMALS GRAZE ON PASTURE ',T71,
> E10.2)
9022 FORMAT('0',T6,'FRACTION OF DAILY FEED THAT IS PASTURE GRASS')
90222 FORMAT(T11,'WHEN ANIMAL GRAZES ON PASTURE',T71,E10.2)
9023 FORMAT('0',T6,'CONSUMPTION RATE OF CONTAMINATED FEED OR FORAGE')
90223 FORMAT(T11,'BY AN ANIMAL IN KG/DAY (DRY WEIGHT)',T71,E10.2)
9024 FORMAT('0',T6,'TRANSPORT TIME FROM ANIMAL FEED-MILK-MAN (DAY)',
> T71,E10.2)
9025 FORMAT('0',T6,'RATE OF INGESTION OF PRODUCE BY MAN (KG/YR)',
> T71,E10.2)
9026 FORMAT('0',T6,'RATE OF INGESTION OF MILK BY MAN (LITERS/YR)',
> T71,E10.2)
9027 FORMAT('0',T6,'RATE OF INGESTION OF MEAT BY MAN (KG/YR)', T71,
> E10.2)
9028 FORMAT('0',T6,'RATE OF INGESTION OF LEAFY VEGETABLES BY MAN ',

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    > '(KG/YR)',T71,E10.2)
9029 FORMAT('0',T6,'AVERAGE TIME FROM SLAUGHTER OF MEAT ANIMAL TO')
90229 FORMAT(T11,'CONSUMPTION (DAY)',T71,E10.2)
9030 FORMAT('0',T6,'FRACTION OF PRODUCE INGESTED GROWN IN GARDEN ',
    > 'OF INTEREST',T71,E10.2)
9031 FORMAT('0',T6,'FRACTION OF LEAFY VEGETABLES GROWN IN GARDEN ',
    > 'OF INTEREST',T71,E10.2)
9032 FORMAT(5I4,5E10.3)
9033 FORMAT(T11,A1,T15,E10.3,T27,E10.3)
9034 FORMAT(A8,T10,E10.3)
9035 FORMAT(T11,E10.3)
9036 FORMAT('0',T6,'AVERAGE FRACTION OF ANIMAL'S DAILY INTAKE OF ',
    > 'NUCLIDE')
90336 FORMAT(T10, 'WHICH APPEARS IN EACH L OF MILK (DAYS/L)',T71,E10.2)
9037 FORMAT('0',T6,'FRACTION OF ANIMAL'S DAILY INTAKE OF NUCLIDE')
90337 FORMAT(T10,'WHICH APPEARS IN EACH KG OF FLESH (DAYS/KG)',
    > T71,E10.2)
9038 FORMAT('0',T6,'CONCENTRATION FACTOR FOR UPTAKE OF NUCLIDE FROM ',
    > 'SOIL FOR')
90338 FORMAT(T10,'PASTURE AND FORAGE',T71,E10.2)
9039 FORMAT(' ',T10,'(IN PCI/KG DRY WEIGHT PER PCI/KG DRY SOIL)')
9040 FORMAT('0',T6,'CONCENTRATION FACTOR FOR UPTAKE OF NUCLIDE FROM ',
    > 'SOIL BY')
90440 FORMAT(T10,'EDIBLE PARTS OF CROPS',T71,E10.2)
9041 FORMAT(' ',T10,'(IN PCI/KG WET WEIGHT PER PCI/KG DRY SOIL)')
9042 FORMAT('0',T6,'GI UPTAKE FRACTION (INHALATION)',T71,E10.2)
9043 FORMAT('0',T6,'GI UPTAKE FRACTION (INGESTION)',T71,E10.2)
9044 FORMAT('0',T6,'PARTICLE SIZE (MICRONS)',T71,E10.2)
9045 FORMAT('0',T6,'SOLUBILITY CLASS',T71,A1)
9046 FORMAT('0',T20,'CONCENTRATIONS ON GROUND AND WATER INCLUDE CONTRIB
    >UTIONS RESULTING FROM ')
9047 FORMAT(' ',T20,'DECAY OF THE FOLLOWING PARENT NUCLIDES AFTER DEPOS
    >ITION--')
9048 FORMAT('0',T40,'NUCLIDE',T67,'BUILDUP FACTOR')
9049 FORMAT('0',T41,A8,T69,E10.3)
9050 FORMAT(' ',T41,A8,T69,E10.3)
9059 FORMAT(' ',T6,I2,T18,I7,T45,E10.3,T68,E10.3,T92,E10.3,T118,E10.3)
9061 FORMAT(6I10)
9062 FORMAT(16I5)
9063 FORMAT(16I5)
9064 FORMAT(8E10.3)
9065 FORMAT(8F10.1)
9066 FORMAT(40I2)
9067 FORMAT(I10)
9068 FORMAT(6F10.3)
9069 FORMAT(6F10.3)

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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9070 FORMAT (10F8.4)
9072 FORMAT('0')
9079 FORMAT('0',T21,'*VALUES FOR RADIONUCLIDE-INDEPENDENT VARIABLES*')
9080 FORMAT('0',T6,'NUMBER OF NUCLIDES CONSIDERED',T71,I10)
9081 FORMAT('0',T6,'VEGETABLE INGESTION RATIO-IMMEDIATE')
90881 FORMAT(T11,'SURROUNDING AREA/TOTAL WITHIN AREA',T71,E10.2)
9082 FORMAT('0',T6,'MEAT INGESTION RATIO-IMMEDIATE')
90882 FORMAT(T11,'SURROUNDING AREA/TOTAL WITHIN AREA',T71,E10.2)
9083 FORMAT('0',T6,'MILK INGESTION RATIO-IMMEDIATE')
90883 FORMAT(T11,'SURROUNDING AREA/TOTAL WITHIN AREA',T71,E10.2)
9084 FORMAT(' ',T6,'MINIMUM FRACTIONS OF FOOD TYPES FROM OUTSIDE AREA')
90884 FORMAT(T10,'LISTED BELOW ARE ACTUAL FIXED VALUES')
9085 FORMAT(' ',T15,'**ACTUAL FRACTIONS OF FOOD TYPES FROM OUTSIDE',
> ' AREA CAN BE GREATER')
90885 FORMAT(T26,'THAN THE MINIMUM FRACTIONS LISTED BELOW**')
9086 FORMAT('0',T6,
> 'MINIMUM FRACTION VEGETABLES INGESTED FROM OUTSIDE AREA',T71,
> E10.2)
9087 FORMAT('0',T6,'MINIMUM FRACTION MEAT INGESTED FROM OUTSIDE AREA',
> T71,E10.2)
9088 FORMAT('0',T6,'MINIMUM FRACTION MILK INGESTED FROM OUTSIDE AREA',
> T71,E10.2)
9089 FORMAT('0',T6,'INHALATION RATE OF MAN (CUBIC CENTIMETERS/HR)',
> T71,E10.2)
9090 FORMAT('0',T6,'BUILDUP TIME FOR RADIONUCLIDES DEPOSITED')
90990 FORMAT(T11,'ON GROUND AND WATER (DAYS)',T71,E10.2)
9091 FORMAT('0',T6,'DILUTION FACTOR FOR WATER FOR SWIMMING (CM)',T71,
> E10.2)
9092 FORMAT('0',T6,'FRACTION OF TIME SPENT SWIMMING',T71,E10.2)
9093 FORMAT('0',T6,'MUSCLE MASS OF ANIMAL AT SLAUGHTER (KG)',T71,
> E10.2)
9094 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION-VEGETABLES', T71,
> E10.2)
9095 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION-PASTURE',T71,E10.2)
9096 FORMAT('0',T6,'FRACTION OF ANIMAL HERD SLAUGHTERED PER DAY',T71,
> E10.2)
9097 FORMAT('0',T6,'MILK PRODUCTION OF COW (LITERS/DAY)',T71,E10.2)
9098 FORMAT('0',T6,'FRACTION OF RADIOACTIVITY RETAINED ON LEAFY')
90998 FORMAT(T11,'VEGETABLES AND PRODUCE AFTER WASHING',T71,E10.2)
9099 FORMAT('0',T21,'*COMPUTED VALUES FOR THE AREA*')
9100 FORMAT('0',T6,'TOTAL POPULATION',T71,F12.1)
9101 FORMAT('0',T6,'TOTAL NUMBER OF MEAT ANIMALS',T71,I12)
9102 FORMAT('0',T6,'TOTAL NUMBER OF MILK CATTLE',T71,I12)
9103 FORMAT('0',T6,
> 'TOTAL AREA OF VEGETABLE FOOD CROPS (SQUARE METERS)',T71,E10.2)
9104 FORMAT('0',T6,'TOTAL MEAT CONSUMPTION (KG PER YEAR)',T71,E10.2)

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AIRDOS-EPA (AIRDOS2.FOR) Program File
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9105 FORMAT('0',T6,'TOTAL MEAT PRODUCTION (KG PER YEAR)',T71,E10.2)
9106 FORMAT('0',T6,'TOTAL MILK CONSUMPTION (LITERS/YEAR)',T71,E10.2)
9107 FORMAT('0',T6,'TOTAL MILK PRODUCTION (LITERS/YEAR)',T71,E10.2)
9108 FORMAT('0',T6,'TOTAL VEGETABLE FOOD CONSUMPTION (KG PER YEAR)',
    > T71,E10.2)
9109 FORMAT('0',T6,'TOTAL VEGETABLE FOOD PRODUCED (KG PER YEAR)',T71,
    > E10.2)
9110 FORMAT(8X,I2,4E10.3,I10,2E10.3)
9111 FORMAT(11F5.3)
9112 FORMAT (2E10.3,I1,6F8.4)
9113 FORMAT('1',T42,'RESULTS OF DOSE COMPUTATIONS FOR NUCLIDE ',A8)
9114 FORMAT('0',T15,'AREA',T26,'ORGAN',T60,
    > 'DOSE THROUGH EACH PATHWAY (REMS/YEAR)')
9115 FORMAT('0',T11,'COLUMN',T20,'ROW')
9116 FORMAT('0',T40,'INHALATION',T55,'SUBMERSION',T70,'SURFACE',T85,
    > 'INGESTION',T100,'SUBMERSION',T117,'TOTAL')
9117 FORMAT(' ',T57,'IN AIR',T69,'EXPOSURE',T102,'IN WATER')
9118 FORMAT(' ',T13,I2,T20,I2,T25,A8,T40,E10.3,T55,E10.3,T70,E10.3,T85,
    > E10.3,T100,E10.3,T115,E10.3)
9119 FORMAT('0',T21,'*LIST OF INPUT DATA FOR NUCLIDE ',A8,'*')
9120 FORMAT('0',T13,'FLAG ERROR')
9121 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION-VEGETABLES', T71,
    > E10.2)
9122 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION-PASTURE',T71,E10.2)
9123 FORMAT ('0',T6, 'FALLOUT INTERCEPTION FRACTION(DRY)-VEGETABLES',
    > T71, E10.2)
9124 FORMAT ('0',T6, 'FALLOUT INTERCEPTION FRACTION(WET)-VEGETABLES',
    > T71, E10.2)
9125 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION(DRY)-PASTURE', T71,
    > E10.2)
9126 FORMAT('0',T6,'FALLOUT INTERCEPTION FRACTION(WET)-PASTURE', T71,
    > E10.2)
9127 FORMAT('0',T6,'RADIOACTIVE DECAY CONSTANT (PER DAY)',T71,E10.2)
9128 FORMAT('0',T25,'RADIOACTIVE DECAY FOR SURFACE EXPOSURE AND FOR WAT
    >ER IMMERSION PROCEEDS IN ACCORDANCE WITH THE')
9129 FORMAT(' ',T25,'EFFECTIVE DECAY CONSTANT IN THE PLUME INSTEAD OF T
    >HE ABOVE VALUE')
9130 FORMAT('0',T6,'ENVIRONMENTAL DECAY CONSTANT--SURFACE (PER DAY)',
    > T71,E10.2)
9131 FORMAT('0',T6,'ENVIRONMENTAL DECAY CONSTANT--WATER (PER DAY)',
    > T71,E10.2)
9132 FORMAT('0',T6,'DOSE CONVERSION FACTOR FOR FOOD INGESTION (REM-CC/
    >PCI-YEAR)',T71,E10.2)
9133 FORMAT('0',T6,'DOSE CONVERSION FACTOR FOR WATER INGESTION (REM-CC
    >/PCI-YEAR)',T71,E10.2)
C9134 FORMAT('0',T55,'DOSE CONVERSION FACTORS')

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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C9135 FORMAT('0',T5,'ORGAN',T20,'INHALATION',T38,'INGESTION',T58,
C   > 'SUBMERSION IN AIR',T83,'SURFACE EXPOSURE',T107,
C   > 'SUBMERSION IN WATER')
C9136 FORMAT(' ',T17,'(REMS/MICROCURIE)',T34,'(REMS/MICROCURIE)',T59,
C   > '(REMS-CUBIC CM/',T83,'(REMS-SQUARE CM/',T109,'(REMS-CUBIC CM/')
C9137 FORMAT(' ',T60,'MICROCURIE-HR)',T84,'MICROCURIE-HR)',T110,
C   > 'MICROCURIE-HR')
C9138 FORMAT(' ',T4,A8,T21,E10.3,T38,E10.3,T61,E10.3,T86,E10.3,T111,
C   > E10.3)
9139 FORMAT(10A8)
9150 FORMAT(8I10)
9155 FORMAT(8(1PE10.3))
9160 FORMAT(A8)
END
```

C*****
20620032

```
      SUBROUTINE DOSMIC(CALC_EQUIL_FRACTIONS,NEWVAL,RNPTR,IDIST,NAMES,
+      DATE_AND_TIME)
```

C

```
      REAL CALC_EQUIL_FRACTIONS(20),NEWVAL(20,20)
      INTEGER*2 RNPTR
      INTEGER IDIST(20)
      CHARACTER*8 NAMES(11)
      CHARACTER*36 DATE_AND_TIME
      CHARACTER*8 NAMNUC,WORD
      CHARACTER*3 DIRECTION(16)
      COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD, ACON(36,20,
```

20710032

```
      > 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11),
ORMODI(36,12,8)20720032
```

```
      > , VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
```

20730032

```
      COMMON /NCOM/ NOML(11),NRML(11)
      COMMON /FCOM/ FEQWL,INTPA(20,20)
      COMMON /OCOMCHAR/ NAMNUC(36),WORD
      REAL INTPA,NEWCWL
      DIMENSION WL(20,20)
      DATA DIRECTION/'N ','NNW','NW ','WNW','W ','WSW','SW ','SSW',
+ 'S ','SSE','SE ','ESE','E ','ENE','NE ','NNE'/
      ALI = LIPO
      IF (FEQWL.EQ. 0.) FEQWL = 0.7
      CWL = 0
      NEWCWL = 0
      DO 510 NO=NOL,NOU
      DO 500 NR=NRL,NRU
      WL(NO,NR) = FEQWL * 10. * ACON(RNPTR,NO,NR) *
```


AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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      +          ( ALI * ( INTPA(NO,NR) - 1. ) + 1. )
      CWL=CWL+WL(NO,NR)
      NEWCWL=NEWCWL+NEWWAL(NO,NR)
500    CONTINUE
510    CONTINUE
      WRITE(51,90277) DATE_AND_TIME
      WRITE(51,9027)
      WRITE(51,90227)
C      WRITE(51,9038)FEQWL
      WRITE(51,9003)
      WRITE(51,9028)
      WRITE(51,9040)
      WRITE(51,9019)
      WRITE(51,9029)
      WRITE(51,9030)
      WRITE(51,9003)
      WRITE(51,9032) ((DIRECTION(NO),IDIST(NR),WL(NO,NR),
      +          CALC_EQUIL_FRACTIONS(NR),
      +          NEWWAL(NO,NR),NR=NRL,NRU),NO=NOL,NOU)
560    CONTINUE
      IF (LIPO.EQ.1) GO TO 569
      WRITE(51,90277) DATE_AND_TIME
      WRITE(51,9034)
      WRITE(51,9035)
      WRITE(51,9036)
      WRITE(51,936)
      WRITE(51,9019)
      WRITE(51,9037) (NAMES(J),NOML(J),NRML(J),WL(NOML(J),NRML(J)),
      >          CALC_EQUIL_FRACTIONS(J),NEWWAL(NOML(J),NRML(J)),
      +          J = 1,11)
CC 569 IF(LIPO.EQ.1) WRITE(51,9039)CWL,NEWCWL
569 IF(LIPO.EQ.1) WRITE(51,9039)NEWCWL

570    CONTINUE
      RETURN
9000    FORMAT('1',T36,'PERCENT OF ',A8,' DOSE BY EACH PATHWAY')
9003    FORMAT('0')
9019    FORMAT(' ')
90277   FORMAT('1',T10,'DATE',2X,A)
9027    FORMAT('0',T20,'EXPOSURE LEVELS FOR SHORT-LIFE PROGENY OF RN-222')
90227   FORMAT(T27,'AT VARIOUS LOCATIONS IN THE ENVIRONMENT')
9028    FORMAT(' ',T8,'AREA',T25,'EXPOSURE LEVEL(.7 EQF)',T52,'ADJUSTED'
      +          ,T70,'ADJUSTED')
9029    FORMAT(' ',T3,'WIND',T12,'DISTANCE')
9030    FORMAT(' ',T2,'TOWARD',T12,'(METERS)')
9032    FORMAT(' ',T3,A3,T10,I7,T33,1PE7.1,T52,0PF7.2,T68,1PE7.1)

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

9034 FORMAT('0',T10,'EXPOSURE LEVEL FOR SHORT-LIFE PROGENY OR RN-222',
+          ' AT LOCATION OF MAXIMUM')
9035 FORMAT(' ',T23,'INDIVIDUAL DOSE FROM ALL PATHWAYS FOR EACH ORGAN')
9036 FORMAT('0',T2,'ORGAN',T15,'LOCATION OF' ,T29,
+          '> 'EXPOSURE LEVEL(.7 EQF)',T56,'ADJUSTED',T70,'ADJUSTED')
936  FORMAT(' ',T15,'MAXIMUM DOSE',T54,'EQUIL. FRACT.',T70,'EXPOSURE'
+          ',/,T71,'LEVELS')
9037 FORMAT(' ',T1,A8,T20,I2,T27,I2,T33,1PE7.1,T52,1PE7.1,T68,1PE7.1)
C9038 FORMAT(' ',T32,'(FRACTION OF EQUILIBRIUM ASSUMED FOR WORKING LEVEL
C  > CALCULATIONS=',F5.3,')')
9039 FORMAT('0',T29,'COLLECTIVE EXPOSURE LEVELS -> ',T67,E10.3)
9040 FORMAT(' ',T30,'(PERSON .WL)',T50,'EQUIL. FRACT.',T70,'EXPOSURE'
+          ',/,T71,'LEVELS')

```

END

C*****
C*****

SUBROUTINE QX(BND,X,U,UD,HS,VD,VG,INDEX1,QXR)

C

C-----NUMERICAL INTEGRATION BY SIMPSON'S RULE

C-----ROUTINE CHANGED BY D.P.STEWART 7/76

C

REAL AB(7,4,2)

INTEGER AC(5,4)

C

```

          1            2            3            4            5            6            7
DATA AB/ 1.0000, 1.0000, .9540, .8061, .8600, .8823, .8257,
> 99.9999,99.9999, .8330, .6715, .6290, .6321, .6547, 99.9999,
> 99.9999, .5524, .5099, .4054, .3710, .3818, 99.9999,99.9999,
> 99.9999, .5251, .1110, .1106, .1106, 5.0200, 8.3500,10.0150,
> 7.4800,15.5000,34.7000,61.2500, 99.9999,99.9999, 4.4000, 2.9500,
> 3.1500, 6.1320,18.8000, 99.9999,99.9999, .3320, .8100, .5240,
> .7640, 2.1150, 99.9999,99.9999,99.9999, .9300, .0349, .0694,
> .1739/

```

C

```

          1            2            3            4            5
DATA AC/ 0, 0,99999, 1000, 1000, 1000, 1000, 0,10000, 3000, 10000,
> 3000, 0,99999,10000, 0,10000, 0, 0,99999/
FUNC(D,F,HH,X)=F*EXP(-(HH**2*F**2)/(2.*X**(2*D)))/X**D
IF (INDEX1-3) 10,20,30

```

C-----SET UP BOUNDS OF INTEGRATION

C-----INDEX3 GIVES COLUMN OF AC CONTAINING LOWER BOUNDS

C-----INDEX4 GIVES COLUMN WITH UPPER BOUND

C-----LIM1 AND LIM2 DETERMINE THE ROWS OF AC USED

C-----THEY ALSO DETERMINE WHICH VALUES OF D AND F SHOULD BE USED

10 INDEX3=1

INDEX4=3

LIM2=1

LIM1=1

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(continued)

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      GO TO 40
20  INDEX3=1
      INDEX4=4
      LIM2=3
      LIM1=1
      IF (BND.GE.1000.) LIM1=2
      IF (BND.GE.10000) LIM1=3
      GO TO 40
30  INDEX3=2
      INDEX4=5
      LIM2=4
      LIM1=1
      IF (BND.GE.1000) LIM1=2
      IF (BND.GE.3000) LIM1=3
      IF (BND.GE.10000) LIM1=4
40  QXR=0
      STOR1=AC(INDEX3,LIM1)
      AC(INDEX3,LIM1)=BND
      AC(INDEX4,LIM2)=X
      EPS=.1
C-----THIS LOOP SPLITS THE INTEGRATION ACCORDING TO CHANGES IN D AND F
      DO 90 INDEX2=LIM1,LIM2
        D=AB(INDEX1,INDEX2,1)
        F=AB(INDEX1,INDEX2,2)
        B=AC(INDEX4,INDEX2)
        IF (X.LT.B) B=X
        A=AC(INDEX3,INDEX2)
        WIDTH=(B-A)/2.
        JLIM=1
C-----FOFA AND FOFB ARE THE FUNCTION VALUES AT ENDPOINTS OF INTERVAL
        FOFA=0.0
        IF (A.EQ.0.0) GO TO 50
        HA=HS-VG*A/UD
        IF (HA.LT.1.0) HA=1.0
        FOFA=FUNC(D,F,HA,A)
50      HB=HS-VG*B/UD
        IF (HB.LT.1.0) HB=1.0
        FOFB=FUNC(D,F,HB,B)
        X1=A+WIDTH
        H1=HS-VG*X1/UD
        IF (H1.LT.1.0) H1=1.0
C-----COMPUTE FIRST APPROXIMATION OF SIMP
        SIMP=(FOFA+4*FUNC(D,F,H1,X1)+FOFB)*WIDTH/3.
C-----THIS SECTION IS REPEATED UNTIL THE CHANGE IN SIMP IS LESS THAN EPS
60      FUNC1=0.0
        FUNC2=0.0

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

WIDTH=WIDTH/2
JLIM=JLIM*2
OLDS=SIMP
JLESS=JLIM-1
DO 70 J=1,JLESS
    X1=A+(2*J-1.)*WIDTH
    H1=HS-VG*X1/UD
    IF (H1.LT.1.0) H1=1.0
    FUNC1=FUNC1+FUNC(D,F,H1,X1)
    X2=A+2*J*WIDTH
    H2=HS-VG*X2/UD
    IF (H2.LT.1.0) H2=1.0
    FUNC2=FUNC2+FUNC(D,F,H2,X2)
70  CONTINUE
    X1=A+2*JLIM*WIDTH
    H1=HS-VG*X1/UD
    IF (H1.LT.1.0) H1=1.0
    FUNC1=FUNC1+FUNC(D,F,H1,X1)
    SIMP=(FOFA+4*FUNC1+2*FUNC2+FOFB)*WIDTH/3
    IF (ABS(SIMP-OLDS).GT.EPS) GO TO 60
C-----END SIMP APPROXIMATION LOOP
80  QXR=QXR+SIMP
    IF (X.LT.AC(INDEX4,INDEX2)) GO TO 100
90  CONTINUE
100 QXR=EXP(-.79788*QXR*VD/UD)
    AC(INDEX3,LIM1)=STOR1
    RETURN
    END
C*****
C*****
SUBROUTINE QY(BND,X,U,UD,HS,VD,VG,INDEX1,QXR)
C
C   R. E. MOORE   HEALTH AND SAFETY RESEARCH DIV.,   ORNL   3-1-78
C
C   A TABLE CALLOUT SUBROUTINE FOR DETERMINING DEPLETION FRACTIONS F
C   DEPOSITION FOR CONSTANT DEPOSITION VELOCITY AND FOR ZERO GRAVITA
C   EFFECT.
C
C   TABULATED VALUES IN DATA STATEMENT WERE DERIVED THROUGH THE USE
C   SUBROUTINE QX, A SIMPSON'S RULE SUBROUTINE WRITTEN ORIGINALLY BY
C   D. E. DUNNING, MODIFIED BY J. F. HULL, AND LATER CHANGED BY
C   D. P. STEWART.
C
COMMON /QCOM/ REFA(34,7,20)
DIMENSION XIDI(20),KP(34)
REAL KP

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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```

      INTEGER IDOM
      DATA XIDI/35.,65.,100.,150.,200.,300.,400.,500.,650.,800.,1000.,
> 1500.,2000.,4000.,7000.,10000.,25000.,60000.,90000.,200000./
      DATA KP/1.,1.5,2.,3.,4.,5.,6.,7.,8.,9.,10.,12.5,15.,17.5,20.,25.,
> 30.,35.,40.,50.,60.,70.,80.,90.,100.,120.,140.,160.,180.,200.,
> 240.,260.,300.,400./
      IF (IDOM.EQ.121) GO TO 20
10  CALL QY1
      CALL QY2
      CALL QY3
      IDOM=121
20  JH=INDEX1
      H1=HS
      DO 30 ID=1,20
          IF (X.LT.XIDI(ID)) GO TO 50
30      CONTINUE
40  ID2=35
      GO TO 60
50  ID1=ID
      ID2=ID-1
60  DO 70 KR=1,34
          IF (H1.LT.KP(KR)) GO TO 90
70      CONTINUE
80  KP2=21
      GO TO 100
90  KP1=KR
      KP2=KR-1
100 IF (KP2.EQ.0.AND.ID2.EQ.0) GO TO 140
      IF (KP2.EQ.0) GO TO 150
      IF (ID2.EQ.0) GO TO 170
      IF (X.GE.200000.) GO TO 110
      IF (H1.GE.400.) GO TO 130
      CUX1=REFA(KP1,JH,ID2)-((REFA(KP1,JH,ID2)-REFA(KP1,JH,ID1))* ((X-
> XIDI(ID2))/(XIDI(ID1)-XIDI(ID2))))
      CUX2=REFA(KP2,JH,ID2)-((REFA(KP2,JH,ID2)-REFA(KP2,JH,ID1))* ((X-
> XIDI(ID2))/(XIDI(ID1)-XIDI(ID2))))
      CUXA=CUX1-(((CUX1-CUX2)*(KP(KP1)-H1))/(KP(KP1)-KP(KP2)))
      GO TO 190
110 IF (H1.GT.400.) GO TO 120
      CUX1=X*((REFA(KP1,JH,20)-REFA(KP1,JH,19))/110000.)+(REFA(KP1,JH,
> 19)-.8181818*(REFA(KP1,JH,20)-REFA(KP1,JH,19)))
      CUX2=X*((REFA(KP2,JH,20)-REFA(KP2,JH,19))/110000.)+(REFA(KP2,JH,
> 19)-.8181818*(REFA(KP2,JH,20)-REFA(KP2,JH,19)))
      CUXA=CUX1-(((CUX1-CUX2)*(KP(KP1)-H1))/(KP(KP1)-KP(KP2)))
      GO TO 190
120 CUM1=H1*((REFA(34,JH,20)-REFA(33,JH,20))/100.)+4.*REFA(33,JH,20)-

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

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    > 3.*REFA(34,JH,20)
    CUM2=H1*((REFA(34,JH,19)-REFA(33,JH,19))/100.)+4.*REFA(33,JH,19)-
    > 3.*REFA(34,JH,19)
    CUXA=((CUM1-CUM2)/110000.)*X+CUM1-1.8181818*(CUM1-CUM2)
    GO TO 190
130 CUX1=H1*((REFA(34,JH,ID1)-REFA(33,JH,ID1))/100.)+4.*REFA(33,JH,
    > ID1)-3.*REFA(34,JH,ID1)
    CUX2=H1*((REFA(34,JH,ID2)-REFA(33,JH,ID2))/100.)+4.*REFA(33,JH,
    > ID2)-3.*REFA(34,JH,ID2)
    CUXA=((CUX2-CUX1)/(XIDI(ID2)-XIDI(ID1)))*(X-XIDI(ID1))+CUX1
    GO TO 190
140 CUXA=1.-(1.-REFA(1,JH,1))*(X/XIDI(1))
    GO TO 190
150 IF (X.GE.200000.) GO TO 160
    CUXA=REFA(1,JH,ID2)-((REFA(1,JH,ID2)-REFA(1,JH,ID1))*((X-
    > XIDI(ID2))/(XIDI(ID1)-XIDI(ID2))))
    GO TO 190
160 CUXA=((REFA(1,JH,20)-REFA(1,JH,19))/110000.)*X+REFA(1,JH,20)-
    > 1.8181818*(REFA(1,JH,20)-REFA(1,JH,19))
    GO TO 190
170 IF (H1.GT.400.) GO TO 180
    CUX1=1.-(1.-REFA(KP1,JH,1))*(X/XIDI(1))
    CUX2=1.-(1.-REFA(KP2,JH,1))*(X/XIDI(1))
    CUXA=CUX1-(((CUX1-CUX2)*(KP(KP1)-H1))/(KP(KP1)-KP(KP2)))
    GO TO 190
180 CUX1=1.-((1.-REFA(33,JH,1))*(X/XIDI(1)))
    CUX2=1.-((1.-REFA(34,JH,1))*(X/XIDI(1)))
    CUXA=((CUX2-CUX1)/100.)*H1+CUX1-3.*(CUX2-CUX1)
190 QXR=CUXA**((100.*VD)/UD)
    RETURN
    END

```

```

C*****
C*****
    SUBROUTINE QY1
    COMMON /QCOM/ REFA(34,7,20)
    DIMENSION SEFA(34,7,20)
    DIMENSION AA(114),AB(114),AC(114),AD(114),AE(114),AF(114),AG(114),
    > AH(114),AI(114),AJ(114),AK(114),AL(114),AM(114),AN(114),AO(70)
    EQUIVALENCE (SEFA( 1,1, 1),AA(1)),(SEFA(13,4, 1),AB(1)),(SEFA(25,
    > 7, 1),AC(1)),(SEFA( 3,4, 2),AD(1)),(SEFA(15,7, 2),AE(1)),
    > (SEFA(27,3, 3),AF(1)),(SEFA( 5,7, 3),AG(1)),(SEFA(17,3, 4),AH(1))
    > , (SEFA(29,6, 4),AI(1)),(SEFA( 7,3, 5),AJ(1)),(SEFA(19,6, 5),AK(1)
    > ), (SEFA(31,2, 6),AL(1)),(SEFA( 9,6, 6),AM(1)),(SEFA(21,2, 7),
    > AN(1)),(SEFA(33,5, 7),AO(1))
    DATA AA/ .9229E 00,.9370E 00,.9483E 00,.9639E 00,.9728E 00,.9798E
    > 00, .9851E 00,.9882E 00,.9919E 00,.9941E 00,.9957E 00,.9982E 00,

```

AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .9991E 00,.9993E 00,.9997E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.9051E 00,.9283E 00,
> .9448E 00,.9665E 00,.9790E 00,.9878E 00,.9929E 00,.9959E 00,
> .9978E 00,.9988E 00,.9991E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8943E 00,.9259E 00,.9476E 00,.9738E 00,
> .9874E 00,.9943E 00,.9976E 00,.9990E 00,.9990E 00,.9996E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8839E 00,.9234E 00,.9494E 00,.9791E 00,.9922E 00,.9974E 00,
> .9992E 00,.9994E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01/
DATA AB/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.8958E 00,.9496E 00,
> .9775E 00,.9966E 00,.9988E 00,.9999E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .9994E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AC/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.9004E 00,.9151E 00,
> .9256E 00,.9408E 00,.9510E 00,.9590E 00,.9655E 00,.9708E 00,
> .9752E 00,.9789E 00,.9820E 00,.9875E 00,.9921E 00,.9948E 00,
> .9967E 00,.9987E 00,.9989E 00,.9996E 00,.9999E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8687E 00,.8921E 00,.9090E 00,.9326E 00,
> .9491E 00,.9611E 00,.9701E 00,.9772E 00,.9826E 00,.9868E 00,
> .9900E 00,.9953E 00,.9979E 00,.9991E 00,.9990E 00,.9998E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

```

> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8445E 00,.8766E 00,.8997E 00,.9319E 00,.9535E 00,.9683E 00,
> .9786E 00,.9858E 00,.9907E 00,.9940E 00,.9963E 00,.9989E 00,
> .9992E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.8222E 00,.8620E 00/
DATA AD/ .8919E 00,.9340E 00,.9603E 00,.9772E 00,.9875E 00,.9934E
> 00,.9965E 00,.9983E 00,.9992E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8008E 00,.8664E 00,.9116E 00,.9637E 00,
> .9867E 00,.9957E 00,.9987E 00,.9990E 00,.9997E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8356E 00,.9325E 00,.9758E 00,.9980E 00,.9996E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.9672E 00,.9983E 00,
> .9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AE/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8850E 00,.8995E 00,.9098E 00,.9246E 00,
> .9352E 00,.9436E 00,.9501E 00,.9556E 00,.9617E 00,.9647E 00,
> .9683E 00,.9757E 00,.9813E 00,.9856E 00,.9882E 00,.9936E 00,
> .9964E 00,.9980E 00,.9990E 00,.9993E 00,.9998E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8442E 00,.8673E 00,.8838E 00,.9075E 00,.9243E 00,.9391E 00,
> .9477E 00,.9561E 00,.9631E 00,.9689E 00,.9739E 00,.9832E 00,
> .9893E 00,.9933E 00,.9959E 00,.9986E 00,.9988E 00,.9996E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.8101E 00,.8412E 00,
> .8642E 00,.8973E 00,.9207E 00,.9386E 00,.9522E 00,.9629E 00,
> .9701E 00,.9779E 00,.9831E 00,.9916E 00,.9961E 00,.9983E 00,
> .9993E 00,.9997E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

```

> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
  DATA AF/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.7752E 00,.8141E 00,.8452E 00,.8897E 00,
> .9221E 00,.9454E 00,.9602E 00,.9745E 00,.9832E 00,.9892E 00,
> .9932E 00,.9979E 00,.9992E 00,.9996E 00,.9999E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .7287E 00,.7957E 00,.8446E 00,.9118E 00,.9519E 00,.9752E 00,
> .9879E 00,.9945E 00,.9976E 00,.9989E 00,.9987E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8569E 00,.9730E 00,.9965E 00,.9999E 00/
  DATA AG/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8707E 00,.8850E 00,.8952E 00,.9098E 00,.9203E 00,.9285E 00,
> .9352E 00,.9412E 00,.9458E 00,.9501E 00,.9529E 00,.9630E 00,
> .9683E 00,.9734E 00,.9777E 00,.9843E 00,.9882E 00,.9923E 00,
> .9947E 00,.9976E 00,.9990E 00,.9989E 00,.9995E 00,.9998E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.8217E 00,.8442E 00,
> .8604E 00,.8838E 00,.9006E 00,.9137E 00,.9243E 00,.9333E 00,
> .9409E 00,.9477E 00,.9535E 00,.9651E 00,.9739E 00,.9796E 00,
> .9855E 00,.9922E 00,.9959E 00,.9980E 00,.9990E 00,.9994E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.7782E 00,.8083E 00,.8307E 00,.8633E 00,
> .8872E 00,.9058E 00,.9208E 00,.9335E 00,.9439E 00,.9527E 00,
> .9601E 00,.9742E 00,.9837E 00,.9898E 00,.9938E 00,.9979E 00/
  DATA AH/ .9994E 00,.9994E 00,.9999E 00,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .7296E 00,.7668E 00,.7964E 00,.8420E 00,.8765E 00,.9035E 00,
> .9251E 00,.9421E 00,.9556E 00,.9663E 00,.9748E 00,.9884E 00,
> .9950E 00,.9979E 00,.9992E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.6637E 00,.7259E 00,
> .7745E 00,.8465E 00,.8968E 00,.9318E 00,.9562E 00,.9726E 00,
> .9834E 00,.9902E 00,.9944E 00,.9987E 00,.9992E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
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> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.6022E 00,.7193E 00,.8070E 00,.9160E 00,
> .9680E 00,.9892E 00,.9968E 00,.9990E 00,.9992E 00,.9998E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AI/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .6767E 00,.8770E 00,.9627E 00,.9981E 00,.9998E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
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> .9352E 00,.9399E 00,.9436E 00,.9515E 00,.9581E 00,.9645E 00,
> .9683E 00,.9757E 00,.9813E 00,.9856E 00,.9882E 00,.9936E 00,
> .9964E 00,.9980E 00,.9990E 00,.9987E 00,.9993E 00,.9998E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8062E 00,.8283E 00,.8442E 00,.8673E 00,
> .8838E 00,.8952E 00,.9075E 00,.9166E 00,.9243E 00,.9312E 00,
> .9391E 00,.9500E 00,.9597E 00,.9676E 00,.9739E 00,.9832E 00,
> .9893E 00,.9933E 00,.9959E 00,.9986E 00,.9988E 00,.9996E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .7559E 00,.7852E 00,.8070E 00,.8391E 00,.8636E 00,.8815E 00/
DATA AJ/ .8968E 00,.9123E 00,.9209E 00,.9306E 00,.9392E 00,.9560E
> 00, .9682E 00,.9774E 00,.9840E 00,.9923E 00,.9965E 00,.9985E 00,
> .9991E 00,.9997E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.6965E 00,.7324E 00,
> .7610E 00,.8058E 00,.8406E 00,.8687E 00,.8920E 00,.9115E 00,
> .9276E 00,.9410E 00,.9523E 00,.9727E 00,.9851E 00,.9922E 00,
> .9961E 00,.9991E 00,.9995E 00,.9999E 00,.1000E 01,.1000E 01,
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> .1000E 01,.1000E 01,.6176E 00,.6765E 00,.7245E 00,.7950E 00,
> .8481E 00,.8886E 00,.9187E 00,.9422E 00,.9593E 00,.9719E 00,
> .9809E 00,.9933E 00,.9977E 00,.9993E 00,.9995E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

```

> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .5252E 00,.6346E 00,.7217E 00,.8462E 00,.9209E 00,.9626E 00,
> .9834E 00,.9933E 00,.9975E 00,.9990E 00,.9989E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AK/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.5351E 00,.7565E 00,
> .8911E 00,.9856E 00,.9988E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8469E 00,.8607E 00,.8707E 00,.8850E 00,
> .8952E 00,.9032E 00,.9098E 00,.9157E 00,.9203E 00,.9246E 00,
> .9285E 00,.9357E 00,.9436E 00,.9490E 00,.9529E 00,.9630E 00,
> .9683E 00,.9734E 00,.9777E 00,.9843E 00,.9882E 00,.9923E 00,
> .9947E 00,.9964E 00,.9976E 00,.9990E 00,.9989E 00,.9995E 00,
> .9998E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .7847E 00,.8061E 00,.8217E 00,.8442E 00,.8604E 00,.8733E 00,
> .8838E 00,.8928E 00,.9006E 00,.9075E 00,.9137E 00,.9267E 00,
> .9391E 00,.9460E 00,.9535E 00,.9651E 00,.9739E 00,.9796E 00,
> .9855E 00,.9922E 00,.9959E 00,.9980E 00,.9990E 00,.9988E 00,
> .9994E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AL/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.7250E 00,.7532E
> 00,.7742E 00,.8052E 00,.8283E 00,.8466E 00,.8627E 00,.8751E 00,
> .8842E 00,.8966E 00,.9056E 00,.9245E 00,.9396E 00,.9515E 00,
> .9611E 00,.9753E 00,.9846E 00,.9906E 00,.9944E 00,.9982E 00,
> .9992E 00,.9996E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.6494E 00,.6831E 00,.7101E 00,.7532E 00,
> .7869E 00,.8151E 00,.8393E 00,.8601E 00,.8806E 00,.8943E 00,
> .9085E 00,.9366E 00,.9568E 00,.9714E 00,.9814E 00,.9927E 00,
> .9972E 00,.9991E 00,.9992E 00,.9999E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .5547E 00,.6084E 00,.6516E 00,.7197E 00,.7728E 00,.8157E 00,
> .8510E 00,.8803E 00,.9042E 00,.9238E 00,.9401E 00,.9682E 00,
> .9841E 00,.9925E 00,.9966E 00,.9994E 00,.9997E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.4271E 00,.5210E 00,
> .6001E 00,.7257E 00,.8180E 00,.8833E 00,.9280E 00,.9574E 00/
DATA AM/ .9758E 00,.9866E 00,.9929E 00,.9986E 00,.9993E 00,.9999E
> 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

```

> .1000E 01,.1000E 01,.3527E 00,.5497E 00,.7144E 00,.9105E 00,
> .9790E 00,.9961E 00,.9993E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8372E 00,.8509E 00,.8607E 00,.8749E 00,.8850E 00,.8930E 00,
> .8995E 00,.9050E 00,.9098E 00,.9141E 00,.9180E 00,.9261E 00,
> .9328E 00,.9380E 00,.9436E 00,.9515E 00,.9581E 00,.9645E 00,
> .9683E 00,.9757E 00,.9813E 00,.9856E 00,.9882E 00,.9916E 00,
> .9936E 00,.9964E 00,.9980E 00,.9990E 00,.9987E 00,.9993E 00,
> .9998E 00,.9999E 00,.1000E 01,.1000E 01,.7698E 00,.7909E 00,
> .8062E 00,.8283E 00,.8442E 00,.8568E 00,.8673E 00,.8761E 00,
> .8838E 00,.8906E 00,.8952E 00,.9099E 00,.9206E 00,.9295E 00,
> .9391E 00,.9500E 00,.9597E 00,.9676E 00,.9739E 00,.9832E 00/
DATA AN/ .9893E 00,.9933E 00,.9959E 00,.9976E 00,.9986E 00,.9988E
> 00,.9996E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.7036E 00,.7309E 00,.7513E 00,.7815E 00,
> .8040E 00,.8220E 00,.8370E 00,.8500E 00,.8621E 00,.8716E 00,
> .8807E 00,.9000E 00,.9157E 00,.9287E 00,.9398E 00,.9569E 00,
> .9681E 00,.9784E 00,.9850E 00,.9932E 00,.9969E 00,.9987E 00,
> .9993E 00,.9995E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .6157E 00,.6478E 00,.6735E 00,.7146E 00,.7474E 00,.7750E 00,
> .8000E 00,.8200E 00,.8387E 00,.8555E 00,.8731E 00,.9023E 00,
> .9268E 00,.9457E 00,.9602E 00,.9797E 00,.9902E 00,.9956E 00,
> .9980E 00,.9991E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.5120E 00,.5618E 00,
> .6020E 00,.6663E 00,.7174E 00,.7599E 00,.8002E 00,.8267E 00,
> .8533E 00,.8764E 00,.8960E 00,.9340E 00,.9594E 00,.9758E 00,
> .9861E 00,.9959E 00,.9988E 00,.9991E 00,.9998E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AO/ .1000E 01,.1000E 01,.3662E 00,.4477E 00,.5183E 00,.6357E
> 00,.7289E 00,.8025E 00,.8590E 00,.9016E 00,.9331E 00,.9556E 00,
> .9712E 00,.9910E 00,.9976E 00,.9993E 00,.9995E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .2497E 00,.4085E 00,.5622E 00,.7974E 00,.9235E 00,.9758E 00,
> .9935E 00,.9984E 00,.9993E 00,.9997E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01/

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
12345678901234567890123456789012345678901234567890123456789012

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DO 30 L=1,7
  DO 20 K=1,7
    DO 10 I=1,34
      REFA(I,K,L)=SEFA(I,K,L)
10      CONTINUE
20      CONTINUE
30      CONTINUE
RETURN
END

```

C*****
C*****

```

SUBROUTINE QY2
COMMON /QCOM/ REFA(34,7,20)
DIMENSION SEFA(34,7,20)
DIMENSION BQ(98),BC(114),BD(114),BE(114),BF(114),BG(114),BH(114),
> BI(114),BJ(114),BK(114),BL(114),BM(114),BN(114),BO(114),BP(86)
EQUIVALENCE (SEFA( 1,1,14),BQ(1)),(SEFA(31,3,14),BC(1)),(SEFA( 9,
> 7,14),BD(1)),(SEFA(21,3,15),BE(1)),(SEFA(33,6,15),BF(1)),
> (SEFA(11,3,16),BG(1)),(SEFA(23,6,16),BH(1)),(SEFA( 1,3,17),BI(1))
> ,(SEFA(13,6,17),BJ(1)),(SEFA(25,2,18),BK(1)),(SEFA( 3,6,18),BL(1)
> ),(SEFA(15,2,19),BM(1)),(SEFA(27,5,19),BN(1)),(SEFA( 5,2,20),
> BO(1)),(SEFA(17,5,20),BP(1))
DATA BQ/ .7636E 00,.7761E 00, .7850E 00,.7979E 00,.8071E 00,
> .8143E 00,.8204E 00,.8254E 00, .8298E 00,.8306E 00,.8372E 00,
> .8448E 00,.8509E 00,.8562E 00, .8607E 00,.8685E 00,.8749E 00,
> .8803E 00,.8850E 00,.8930E 00, .8995E 00,.9050E 00,.9098E 00,
> .9141E 00,.9180E 00,.9246E 00, .9303E 00,.9352E 00,.9399E 00,
> .9436E 00,.9501E 00,.9518E 00, .9581E 00,.9683E 00,.6605E 00,
> .6785E 00,.6915E 00,.7105E 00, .7242E 00,.7351E 00,.7440E 00,
> .7517E 00,.7585E 00,.7644E 00, .7698E 00,.7813E 00,.7909E 00,
> .7990E 00,.8061E 00,.8182E 00, .8283E 00,.8367E 00,.8442E 00,
> .8568E 00,.8673E 00,.8761E 00, .8838E 00,.8906E 00,.8952E 00,
> .9075E 00,.9166E 00,.9243E 00, .9312E 00,.9391E 00,.9477E 00,
> .9521E 00,.9597E 00,.9739E 00, .5360E 00,.5569E 00,.5725E 00,
> .5956E 00,.6084E 00,.6267E 00, .6384E 00,.6485E 00,.6535E 00,
> .6656E 00,.6733E 00,.6889E 00, .7024E 00,.7141E 00,.7246E 00,
> .7402E 00,.7575E 00,.7707E 00, .7824E 00,.8028E 00,.8199E 00,
> .8348E 00,.8483E 00,.8604E 00, .8714E 00,.8912E 00,.9076E 00,
> .9219E 00,.9343E 00,.9441E 00/
DATA BC/ .9600E 00,.9662E 00,.9781E 00,.9923E 00,.3404E 00,.3582E
> 00, .3726E 00,.3958E 00,.4146E 00,.4309E 00,.4453E 00,.4585E 00,
> .4706E 00,.4819E 00,.4925E 00, .5167E 00,.5369E 00,.5585E 00,
> .5771E 00,.6110E 00,.6417E 00, .6700E 00,.6964E 00,.7441E 00,
> .7871E 00,.8225E 00,.8547E 00, .8820E 00,.9051E 00,.9409E 00,
> .9648E 00,.9799E 00,.9890E 00, .9940E 00,.9984E 00,.9993E 00,
> .9999E 00,.1000E 01,.2136E 00, .2346E 00,.2518E 00,.2797E 00,
> .3028E 00,.3229E 00,.3409E 00, .3574E 00,.3737E 00,.3873E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .4011E 00,.4330E 00,.4622E 00,.4896E 00,.5157E 00,.5642E 00,
> .6101E 00,.6527E 00,.6928E 00,.7648E 00,.8252E 00,.8741E 00,
> .9116E 00,.9401E 00,.9605E 00,.9840E 00,.9940E 00,.9978E 00,
> .9994E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .6861E-01,.8460E-01,.9887E-01,.1246E 00,.1481E 00,.1703E 00,
> .1917E 00,.2126E 00,.2331E 00,.2535E 00,.2738E 00,.3243E 00,
> .3750E 00,.4260E 00,.4769E 00,.5765E 00,.6685E 00,.7496E 00,
> .8175E 00,.9120E 00,.9625E 00,.9853E 00,.9947E 00,.9981E 00,
> .9995E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.3687E-02,.6718E-02,
> .1064E-01,.2151E-01,.3705E-01,.5805E-01,.8520E-01,.1190E 00/
DATA BD/ .1596E 00,.2075E 00,.2597E 00,.4086E 00,.5628E 00,.6993E
> 00, .8076E 00,.9341E 00,.9816E 00,.9953E 00,.9990E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.7439E 00,.7587E 00,.7649E 00,.7801E 00,
> .7864E 00,.7963E 00,.8020E 00,.8071E 00,.8085E 00,.8152E 00,
> .8187E 00,.8260E 00,.8321E 00,.8372E 00,.8417E 00,.8493E 00,
> .8555E 00,.8607E 00,.8654E 00,.8732E 00,.8796E 00,.8850E 00,
> .8897E 00,.8939E 00,.8977E 00,.9043E 00,.9098E 00,.9147E 00,
> .9190E 00,.9229E 00,.9295E 00,.9325E 00,.9370E 00,.9483E 00,
> .6364E 00,.6536E 00,.6662E 00,.6845E 00,.6977E 00,.7082E 00,
> .7168E 00,.7242E 00,.7307E 00,.7364E 00,.7416E 00,.7527E 00,
> .7619E 00,.7698E 00,.7767E 00,.7883E 00,.7979E 00,.8062E 00,
> .8133E 00,.8255E 00,.8356E 00,.8442E 00,.8477E 00,.8584E 00,
> .8646E 00,.8749E 00,.8838E 00,.8916E 00,.8973E 00,.9051E 00,
> .9154E 00,.9200E 00,.9283E 00,.9448E 00,.4937E 00,.5129E 00,
> .5273E 00,.5486E 00,.5604E 00,.5772E 00,.5880E 00,.5974E 00,
> .6019E 00,.6131E 00,.6201E 00,.6346E 00,.6470E 00,.6578E 00,
> .6675E 00,.6820E 00,.6980E 00,.7103E 00,.7212E 00,.7403E 00/
DATA BE/ .7566E 00,.7708E 00,.7838E 00,.7957E 00,.8066E 00,.8265E
> 00, .8438E 00,.8593E 00,.8733E 00,.8889E 00,.9075E 00,.9173E 00,
> .9332E 00,.9617E 00,.2670E 00,.2811E 00,.2923E 00,.3106E 00,
> .3254E 00,.3382E 00,.3496E 00,.3599E 00,.3695E 00,.3785E 00,
> .3869E 00,.4062E 00,.4225E 00,.4399E 00,.4551E 00,.4831E 00,
> .5091E 00,.5333E 00,.5568E 00,.6012E 00,.6437E 00,.6817E 00,
> .7185E 00,.7525E 00,.7844E 00,.8389E 00,.8837E 00,.9185E 00,
> .9445E 00,.9632E 00,.9851E 00,.9910E 00,.9970E 00,.9998E 00,
> .1454E 00,.1597E 00,.1714E 00,.1905E 00,.2062E 00,.2200E 00,
> .2324E 00,.2439E 00,.2552E 00,.2647E 00,.2744E 00,.2970E 00,
> .3181E 00,.3383E 00,.3579E 00,.3958E 00,.4330E 00,.4700E 00,
> .5069E 00,.5794E 00,.6489E 00,.7132E 00,.7713E 00,.8220E 00,
> .8646E 00,.9267E 00,.9635E 00,.9831E 00,.9930E 00,.9971E 00,
> .9995E 00,.9998E 00,.1000E 01,.1000E 01,.3230E-01,.3984E-01,
> .4660E-01,.5883E-01,.7010E-01,.8089E-01,.9144E-01,.1019E 00,
> .1124E 00,.1229E 00,.1337E 00,.1615E 00,.1913E 00,.2232E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

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> .2573E 00,.3320E 00,.4135E 00,.4982E 00,.5821E 00,.7337E 00,
> .8479E 00,.9214E 00,.9629E 00,.9836E 00,.9935E 00,.9988E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA BF/ .1000E 01,.1000E 01,.5537E-03,.1017E-02,.1627E-02,.3389E-
> 02, .6080E-02,.1002E-01,.1563E-01,.2338E-01,.3384E-01,.4774E-01,
> .6508E-01,.1285E 00,.2219E 00,.3402E 00,.4721E 00,.7158E 00,
> .8758E 00,.9541E 00,.9853E 00,.9984E 00,.9999E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .7360E 00,.7484E 00,.7567E 00,.7691E 00,.7780E 00,.7850E 00,
> .7907E 00,.7956E 00,.7999E 00,.8037E 00,.8071E 00,.8143E 00,
> .8204E 00,.8254E 00,.8298E 00,.8372E 00,.8434E 00,.8486E 00,
> .8531E 00,.8607E 00,.8672E 00,.8725E 00,.8771E 00,.8813E 00,
> .8850E 00,.8916E 00,.8970E 00,.9018E 00,.9060E 00,.9098E 00,
> .9166E 00,.9194E 00,.9246E 00,.9352E 00,.6215E 00,.6386E 00,
> .6506E 00,.6684E 00,.6813E 00,.6916E 00,.7000E 00,.7034E 00,
> .7135E 00,.7192E 00,.7242E 00,.7351E 00,.7441E 00,.7517E 00,
> .7584E 00,.7698E 00,.7792E 00,.7872E 00,.7943E 00,.8062E 00,
> .8160E 00,.8244E 00,.8318E 00,.8383E 00,.8442E 00,.8545E 00,
> .8632E 00,.8709E 00,.8777E 00,.8838E 00,.8944E 00,.8991E 00,
> .9075E 00,.9243E 00,.4667E 00,.4849E 00,.4984E 00,.5185E 00,
> .5297E 00,.5456E 00,.5558E 00,.5647E 00,.5690E 00,.5795E 00/
DATA BG/ .5862E 00,.5999E 00,.6116E 00,.6219E 00,.6308E 00,.6446E
> 00, .6597E 00,.6713E 00,.6817E 00,.6999E 00,.7154E 00,.7290E 00,
> .7415E 00,.7529E 00,.7767E 00,.7828E 00,.7998E 00,.8153E 00,
> .8294E 00,.8417E 00,.8651E 00,.8752E 00,.8939E 00,.9284E 00,
> .2202E 00,.2318E 00,.2410E 00,.2561E 00,.2683E 00,.2789E 00,
> .2883E 00,.2969E 00,.3048E 00,.3122E 00,.3192E 00,.3353E 00,
> .3488E 00,.3634E 00,.3761E 00,.3999E 00,.4222E 00,.4431E 00,
> .4637E 00,.5033E 00,.5422E 00,.5783E 00,.6143E 00,.6489E 00,
> .6820E 00,.7447E 00,.7983E 00,.8447E 00,.8833E 00,.9140E 00,
> .9563E 00,.9699E 00,.9863E 00,.9984E 00,.1055E 00,.1158E 00,
> .1243E 00,.1382E 00,.1496E 00,.1597E 00,.1688E 00,.1772E 00,
> .1854E 00,.1925E 00,.1996E 00,.2164E 00,.2323E 00,.2476E 00,
> .2626E 00,.2922E 00,.3221E 00,.3526E 00,.3839E 00,.4484E 00,
> .5145E 00,.5819E 00,.6441E 00,.7043E 00,.7591E 00,.8489E 00,
> .9119E 00,.9520E 00,.9756E 00,.9882E 00,.9977E 00,.9985E 00,
> .9997E 00,.1000E 01,.1705E-01,.2104E-01,.2461E-01,.3111E-01,
> .3713E-01,.4294E-01,.4865E-01,.5437E-01,.6016E-01,.6608E-01,
> .7216E-01,.8827E-01,.1061E 00,.1258E 00,.1479E 00,.1992E 00,
> .2602E 00,.3299E 00,.4059E 00,.5647E 00,.7102E 00,.8240E 00/
DATA BH/ .9016E 00,.9489E 00,.9753E 00,.9951E 00,.9987E 00,.9998E
> 00, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1117E-03,.2060E-03,.3318E-03,.7035E-03,.1294E-02,.2200E-02,
> .3561E-02,.5560E-02,.8440E-02,.1255E-01,.1809E-01,.4159E-01,
> .8444E-01,.1521E 00,.2460E 00,.4827E 00,.7077E 00,.8603E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .9419E 00,.9927E 00,.9988E 00,.9999E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.7105E 00,.7221E 00,
> .7294E 00,.7414E 00,.7500E 00,.7567E 00,.7623E 00,.7641E 00,
> .7711E 00,.7748E 00,.7780E 00,.7850E 00,.7907E 00,.7956E 00,
> .7999E 00,.8071E 00,.8130E 00,.8180E 00,.8224E 00,.8298E 00,
> .8358E 00,.8410E 00,.8455E 00,.8495E 00,.8531E 00,.8594E 00,
> .8647E 00,.8693E 00,.8734E 00,.8771E 00,.8835E 00,.8864E 00,
> .8916E 00,.9018E 00,.5851E 00,.6005E 00,.6130E 00,.6289E 00,
> .6410E 00,.6506E 00,.6586E 00,.6654E 00,.6713E 00,.6766E 00,
> .6814E 00,.6916E 00,.7000E 00,.7034E 00,.7135E 00,.7242E 00,
> .7331E 00,.7366E 00,.7472E 00,.7584E 00,.7677E 00,.7714E 00,
> .7825E 00,.7887E 00,.7943E 00,.8040E 00,.8079E 00,.8195E 00,
> .8261E 00,.8318E 00,.8419E 00,.8464E 00,.8544E 00,.8709E 00/
DATA BI/ .3878E 00,.4029E 00,.4142E 00,.4309E 00,.4402E 00,.4534E
> 00,.4619E 00,.4692E 00,.4728E 00,.4816E 00,.4871E 00,.4985E 00,
> .5083E 00,.5168E 00,.5243E 00,.5357E 00,.5484E 00,.5580E 00,
> .5667E 00,.5820E 00,.5950E 00,.6065E 00,.6171E 00,.6268E 00,
> .6470E 00,.6528E 00,.6678E 00,.6817E 00,.6945E 00,.7060E 00,
> .7285E 00,.7386E 00,.7579E 00,.7982E 00,.1120E 00,.1179E 00,
> .1226E 00,.1303E 00,.1365E 00,.1419E 00,.1467E 00,.1511E 00,
> .1552E 00,.1590E 00,.1626E 00,.1709E 00,.1779E 00,.1855E 00,
> .1922E 00,.2049E 00,.2170E 00,.2286E 00,.2402E 00,.2633E 00,
> .2871E 00,.3104E 00,.3349E 00,.3598E 00,.3851E 00,.4379E 00,
> .4903E 00,.5431E 00,.5949E 00,.6448E 00,.7339E 00,.7732E 00,
> .8399E 00,.9423E 00,.2555E-01,.2807E-01,.3013E-01,.3351E-01,
> .3631E-01,.3879E-01,.4104E-01,.4313E-01,.4521E-01,.4700E-01,
> .4885E-01,.5325E-01,.5754E-01,.6182E-01,.6617E-01,.7524E-01,
> .8513E-01,.9603E-01,.1082E 00,.1365E 00,.1712E 00,.2131E 00,
> .2608E 00,.3156E 00,.3761E 00,.5068E 00,.6372E 00,.7521E 00,
> .8426E 00,.9065E 00,.9727E 00,.9851E 00,.9968E 00,.1000E 01,
> .1007E-02,.1244E-02,.1457E-02,.1849E-02,.2219E-02,.2584E-02,
> .2953E-02,.3335E-02,.3733E-02,.4154E-02,.4604E-02,.5880E-02/
DATA BJ/ .7439E-02,.9372E-02,.1178E-01,.1852E-01,.2885E-01,.4429E-
> 01,.6657E-01,.1385E 00,.2527E 00,.4015E 00,.5617E 00,.7066E 00,
> .8197E 00,.9452E 00,.9864E 00,.9972E 00,.9996E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.9405E-07,.1762E-06,
> .2900E-06,.6541E-06,.1310E-05,.2483E-05,.4578E-05,.8309E-05,
> .1494E-04,.2677E-04,.4723E-04,.1902E-03,.7132E-03,.2424E-02,
> .7350E-02,.4533E-01,.1642E 00,.3761E 00,.6127E 00,.9074E 00,
> .9854E 00,.9983E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.6847E 00,.6959E 00,.7021E 00,.7136E 00,
> .7219E 00,.7283E 00,.7337E 00,.7359E 00,.7422E 00,.7458E 00,
> .7488E 00,.7556E 00,.7611E 00,.7659E 00,.7698E 00,.7769E 00,
> .7824E 00,.7874E 00,.7915E 00,.7986E 00,.8045E 00,.8096E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .8138E 00,.8177E 00,.8211E 00,.8271E 00,.8324E 00,.8367E 00,
> .8407E 00,.8442E 00,.8504E 00,.8531E 00,.8580E 00,.8680E 00,
> .5533E 00,.5684E 00,.5795E 00,.5933E 00,.6048E 00,.6138E 00,
> .6213E 00,.6278E 00,.6334E 00,.6384E 00,.6429E 00,.6525E 00,
> .6605E 00,.6673E 00,.6732E 00,.6832E 00,.6915E 00,.6987E 00,
> .7049E 00,.7155E 00,.7242E 00,.7317E 00,.7382E 00,.7440E 00/
DATA BK/ .7493E 00,.7585E 00,.7663E 00,.7731E 00,.7792E 00,.7847E
> 00, .7943E 00,.7985E 00,.8062E 00,.8217E 00,.2979E 00,.3095E 00,
> .3181E 00,.3310E 00,.3381E 00,.3482E 00,.3548E 00,.3604E 00,
> .3631E 00,.3699E 00,.3741E 00,.3829E 00,.3904E 00,.3969E 00,
> .4027E 00,.4115E 00,.4212E 00,.4287E 00,.4353E 00,.4471E 00,
> .4572E 00,.4661E 00,.4743E 00,.4819E 00,.4975E 00,.5022E 00,
> .5141E 00,.5251E 00,.5355E 00,.5448E 00,.5634E 00,.5719E 00,
> .5884E 00,.6248E 00,.4172E-01,.4391E-01,.4567E-01,.4852E-01,
> .5085E-01,.5286E-01,.5465E-01,.5629E-01,.5781E-01,.5923E-01,
> .6058E-01,.6369E-01,.6636E-01,.6923E-01,.7177E-01,.7661E-01,
> .8127E-01,.8579E-01,.9037E-01,.9965E-01,.1094E 00,.1193E 00,
> .1299E 00,.1410E 00,.1527E 00,.1783E 00,.2057E 00,.2356E 00,
> .2675E 00,.3011E 00,.3722E 00,.4091E 00,.4835E 00,.6592E 00,
> .1276E-02,.1402E-02,.1506E-02,.1676E-02,.1818E-02,.1946E-02,
> .2062E-02,.2172E-02,.2283E-02,.2380E-02,.2482E-02,.2732E-02,
> .2987E-02,.3253E-02,.3539E-02,.4178E-02,.4948E-02,.5884E-02,
> .7036E-02,.1020E-01,.1500E-01,.2226E-01,.3285E-01,.4840E-01,
> .6984E-01,.1372E 00,.2418E 00,.3787E 00,.5296E 00,.6713E 00,
> .8716E 00,.9266E 00,.9798E 00,.9995E 00,.2537E-05,.3139E-05/
DATA BL/ .3686E-05,.4710E-05,.5708E-05,.6729E-05,.7808E-05,.8974E-
> 05, .1025E-04,.1168E-04,.1328E-04,.1828E-04,.2532E-04,.3544E-04,
> .5018E-04,.1039E-03,.2224E-03,.4847E-03,.1058E-02,.4772E-02,
> .1847E-01,.5763E-01,.1418E 00,.2781E 00,.4481E 00,.7576E 00,
> .9219E 00,.9801E 00,.9957E 00,.9991E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.2950E-13,.5676E-13,.9703E-13,.2437E-12,
> .5664E-12,.1298E-11,.3005E-11,.7108E-11,.1725E-10,.4305E-10,
> .1090E-09,.1209E-08,.1404E-07,.1584E-06,.1625E-05,.1032E-03,
> .2736E-02,.2892E-01,.1371E 00,.6007E 00,.9042E 00,.9849E 00,
> .9978E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .6645E 00,.6754E 00,.6814E 00,.6925E 00,.7006E 00,.7068E 00,
> .7120E 00,.7141E 00,.7203E 00,.7238E 00,.7267E 00,.7333E 00,
> .7386E 00,.7432E 00,.7470E 00,.7539E 00,.7593E 00,.7641E 00,
> .7681E 00,.7750E 00,.7807E 00,.7857E 00,.7897E 00,.7935E 00,
> .7968E 00,.8027E 00,.8078E 00,.8119E 00,.8158E 00,.8193E 00,
> .8252E 00,.8279E 00,.8327E 00,.8423E 00,.5379E 00,.5526E 00,
> .5608E 00,.5762E 00,.5873E 00,.5961E 00,.6034E 00,.6096E 00,
> .6151E 00,.6200E 00,.6243E 00,.6336E 00,.6414E 00,.6480E 00/
DATA BM/ .6538E 00,.6635E 00,.6716E 00,.6784E 00,.6845E 00,.6947E
> 00, .7032E 00,.7105E 00,.7169E 00,.7225E 00,.7276E 00,.7365E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .7441E 00,.7507E 00,.7566E 00,.7620E 00,.7713E 00,.7754E 00,
> .7828E 00,.7979E 00,.2533E 00,.2632E 00,.2705E 00,.2814E 00,
> .2875E 00,.2962E 00,.3017E 00,.3065E 00,.3088E 00,.3146E 00,
> .3182E 00,.3256E 00,.3320E 00,.3376E 00,.3424E 00,.3499E 00,
> .3582E 00,.3646E 00,.3702E 00,.3803E 00,.3888E 00,.3965E 00,
> .4035E 00,.4100E 00,.4233E 00,.4273E 00,.4375E 00,.4470E 00,
> .4559E 00,.4640E 00,.4801E 00,.4876E 00,.5021E 00,.5345E 00,
> .2252E-01,.2370E-01,.2465E-01,.2619E-01,.2745E-01,.2854E-01,
> .2950E-01,.3039E-01,.3121E-01,.3198E-01,.3271E-01,.3439E-01,
> .3584E-01,.3739E-01,.3878E-01,.4141E-01,.4395E-01,.4643E-01,
> .4895E-01,.5407E-01,.5950E-01,.6503E-01,.7104E-01,.7740E-01,
> .8414E-01,.9908E-01,.1155E 00,.1338E 00,.1539E 00,.1866E 00,
> .2239E 00,.2502E 00,.3064E 00,.4595E 00,.1152E-03,.1266E-03,
> .1360E-03,.1515E-03,.1645E-03,.1762E-03,.1870E-03,.1973E-03,
> .2077E-03,.2170E-03,.2268E-03,.2513E-03,.2771E-03,.3047E-03,
> .3352E-03,.4064E-03,.4970E-03,.6136E-03,.7655E-03,.1225E-02,
> .2019E-02,.3404E-02,.5762E-02,.9766E-02,.1636E-01,.4290E-01/
DATA BN/ .9892E-01,.1957E 00,.3315E 00,.4878E 00,.7641E 00,.8557E
> 00,.9550E 00,.9986E 00,.2082E-07,.2579E-07,.3034E-07,.3895E-07,
> .4752E-07,.5651E-07,.6627E-07,.7711E-07,.8938E-07,.1035E-06,
> .1198E-06,.1739E-06,.2568E-06,.3873E-06,.5966E-06,.1504E-05,
> .4044E-05,.1136E-04,.3259E-04,.2618E-03,.1804E-02,.9618E-02,
> .3775E-01,.1086E 00,.2360E 00,.5815E 00,.8398E 00,.9532E 00,
> .9887E 00,.9971E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,
> .1773E-18,.3477E-18,.6103E-18,.1653E-17,.4267E-17,.1117E-16,
> .3040E-16,.8674E-16,.2603E-15,.8231E-15,.2698E-14,.6198E-13,
> .1639E-11,.4478E-10,.1145E-08,.4389E-06,.5783E-04,.2241E-02,
> .2790E-01,.3603E 00,.7961E 00,.9608E 00,.9944E 00,.9992E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.5953E 00,.6050E 00,
> .6104E 00,.6204E 00,.6276E 00,.6332E 00,.6379E 00,.6398E 00,
> .6453E 00,.6484E 00,.6510E 00,.6569E 00,.6617E 00,.6658E 00,
> .6692E 00,.6754E 00,.6802E 00,.6845E 00,.6881E 00,.6943E 00,
> .6994E 00,.7038E 00,.7074E 00,.7108E 00,.7138E 00,.7190E 00,
> .7236E 00,.7274E 00,.7308E 00,.7339E 00,.7393E 00,.7417E 00,
> .7460E 00,.7546E 00,.4818E 00,.4950E 00,.5024E 00,.5161E 00/
DATA BO/ .5261E 00,.5340E 00,.5405E 00,.5461E 00,.5510E 00,.5554E
> 00,.5593E 00,.5676E 00,.5746E 00,.5805E 00,.5857E 00,.5944E 00,
> .6017E 00,.6078E 00,.6132E 00,.6224E 00,.6300E 00,.6365E 00,
> .6422E 00,.6472E 00,.6518E 00,.6598E 00,.6666E 00,.6725E 00,
> .6778E 00,.6826E 00,.6909E 00,.6946E 00,.7013E 00,.7148E 00,
> .1665E 00,.1730E 00,.1778E 00,.1850E 00,.1890E 00,.1947E 00,
> .1983E 00,.2015E 00,.2030E 00,.2068E 00,.2092E 00,.2140E 00,
> .2182E 00,.2219E 00,.2251E 00,.2300E 00,.2355E 00,.2397E 00,
> .2434E 00,.2500E 00,.2556E 00,.2607E 00,.2653E 00,.2696E 00,
> .2784E 00,.2811E 00,.2879E 00,.2942E 00,.3003E 00,.3058E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

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> .3168E 00,.3216E 00,.3315E 00,.3541E 00,.4445E-02,.4679E-02,
> .4866E-02,.5170E-02,.5418E-02,.5633E-02,.5824E-02,.5999E-02,
> .6162E-02,.6314E-02,.6458E-02,.6792E-02,.7078E-02,.7388E-02,
> .7663E-02,.8189E-02,.8693E-02,.9191E-02,.9700E-02,.1077E-01,
> .1186E-01,.1301E-01,.1427E-01,.1562E-01,.1708E-01,.2036E-01,
> .2409E-01,.2837E-01,.3324E-01,.3873E-01,.5173E-01,.5932E-01,
> .7684E-01,.1353E 00,.3120E-07,.3430E-07,.3686E-07,.4112E-07,
> .4477E-07,.4811E-07,.5126E-07,.5433E-07,.5752E-07,.6046E-07,
> .6362E-07,.7194E-07,.8128E-07,.9203E-07,.1046E-06,.1374E-06/
DATA BP/ .1849E-06,.2553E-06,.3616E-06,.7781E-06,.1815E-05,.4514E-
> 05, .1165E-04,.3083E-04,.8184E-04,.5435E-03,.3051E-02,.1348E-01,
> .4544E-01,.1173E 00,.3945E 00,.5580E 00,.8127E 00,.9910E 00,
> .1555E-14,.1933E-14,.2286E-14,.2977E-14,.3706E-14,.4522E-14,
> .5473E-14,.6609E-14,.7995E-14,.9711E-14,.1186E-13,.2018E-13,
> .3607E-13,.6798E-13,.1349E-12,.6143E-12,.3299E-11,.2013E-10,
> .1339E-09,.6559E-08,.2887E-06,.9102E-05,.1779E-03,.2027E-02,
> .1354E-01,.1542E 00,.4907E 00,.7884E 00,.9324E 00,.9820E 00,
> .9988E 00,.9998E 00,.1000E 01,.1000E 01,.2217E-33,.2222E-33,
> .2231E-33,.2266E-33,.2369E-33,.2738E-33,.4361E-33,.1266E-32,
> .6106E-32,.3799E-31,.2696E-30,.5640E-28,.1856E-25,.7880E-23,
> .3573E-20,.4526E-15,.1309E-10,.4985E-07,.2293E-04,.2535E-01,
> .3578E 00,.7910E 00,.9570E 00,.9932E 00,.9988E 00,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01/
DO 30 L=14,20
  DO 20 K=1,7
    DO 10 I=1,34
      10      REFA(I,K,L)=SEFA(I,K,L)
      20      CONTINUE
      30      CONTINUE
    RETURN
  END

```

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C*****
C*****
SUBROUTINE QY3
COMMON /QCOM/ REFA(34,7,20)
DIMENSION SEFA(34,7,20)
DIMENSION CA(44),AP(114),AQ(114),AR(114),AS(114),AT(114),AU(114),
> AV(114),AW(114),AX(114),AY(114),AZ(114),BA(114),BB(16)
EQUIVALENCE (SEFA( 1,1, 8),CA(1)), (SEFA(11,2, 8),AP(1)),(SEFA(23,
> 5, 8),AQ(1)),(SEFA( 1,2, 9),AR(1)),(SEFA(13,5, 9),AS(1)),
> (SEFA(25,1,10),AT(1)),(SEFA( 3,5,10),AU(1)),(SEFA(15,1,11),AV(1))
> ,(SEFA(27,4,11),AW(1)),(SEFA( 5,1,12),AX(1)),(SEFA(17,4,12),AY(1)
> ),(SEFA(29,7,12),AZ(1)),(SEFA( 7,4,13),BA(1)),(SEFA(19,7,13),
> BB(1))
DATA CA/ .8298E 00,.8434E 00, .8531E 00,.8672E 00,.8771E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .8850E 00,.8916E 00,.8970E 00, .9018E 00,.9060E 00,.9098E 00,
> .9180E 00,.9246E 00,.9303E 00, .9352E 00,.9436E 00,.9501E 00,
> .9556E 00,.9617E 00,.9683E 00, .9744E 00,.9792E 00,.9831E 00,
> .9863E 00,.9882E 00,.9928E 00, .9954E 00,.9972E 00,.9983E 00,
> .9990E 00,.9991E 00,.9994E 00, .9998E 00,.1000E 01,.7585E 00,
> .7792E 00,.7943E 00,.8160E 00, .8318E 00,.8442E 00,.8545E 00,
> .8632E 00,.8709E 00,.8777E 00/
DATA AP/ .8838E 00,.8952E 00,.9075E 00,.9166E 00,.9243E 00,.9391E
> 00, .9477E 00,.9561E 00,.9631E 00,.9739E 00,.9816E 00,.9871E 00,
> .9911E 00,.9940E 00,.9959E 00,.9982E 00,.9993E 00,.9992E 00,
> .9997E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .6871E 00,.7139E 00,.7338E 00,.7634E 00,.7853E 00,.8030E 00,
> .8178E 00,.8306E 00,.8418E 00,.8518E 00,.8616E 00,.8804E 00,
> .8963E 00,.9120E 00,.9213E 00,.9401E 00,.9542E 00,.9652E 00,
> .9737E 00,.9853E 00,.9922E 00,.9959E 00,.9979E 00,.9990E 00,
> .9987E 00,.9997E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.5895E 00,.6204E 00,
> .6450E 00,.6846E 00,.7163E 00,.7432E 00,.7667E 00,.7875E 00,
> .8063E 00,.8232E 00,.8386E 00,.8717E 00,.8986E 00,.9202E 00,
> .9373E 00,.9631E 00,.9790E 00,.9886E 00,.9940E 00,.9985E 00,
> .9991E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.4799E 00,.5268E 00,.5647E 00,.6257E 00,
> .6746E 00,.7160E 00,.7515E 00,.7825E 00,.8098E 00,.8339E 00,
> .8553E 00,.8987E 00,.9304E 00,.9532E 00,.9692E 00,.9876E 00,
> .9955E 00,.9983E 00,.9992E 00,.9999E 00,.1000E 01,.1000E 01/
DATA AQ/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .3226E 00,.3959E 00,.4595E 00,.5680E 00,.6573E 00,.7318E 00,
> .7931E 00,.8424E 00,.8820E 00,.9129E 00,.9370E 00,.9737E 00,
> .9899E 00,.9965E 00,.9987E 00,.9996E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1865E 00,.3136E 00,
> .4461E 00,.6825E 00,.8441E 00,.9331E 00,.9746E 00,.9914E 00,
> .9973E 00,.9991E 00,.9991E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.8211E 00,.8317E 00,.8443E 00,.8551E 00,
> .8680E 00,.8758E 00,.8792E 00,.8876E 00,.8924E 00,.8966E 00,
> .9004E 00,.9060E 00,.9151E 00,.9207E 00,.9256E 00,.9337E 00,
> .9408E 00,.9461E 00,.9510E 00,.9590E 00,.9655E 00,.9708E 00,
> .9752E 00,.9789E 00,.9820E 00,.9868E 00,.9906E 00,.9933E 00,
> .9953E 00,.9967E 00,.9984E 00,.9990E 00,.9989E 00,.9999E 00/
DATA AR/ .7453E 00,.7657E 00,.7805E 00,.8019E 00,.8174E 00,.8296E

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> 00, .8397E 00,.8483E 00,.8559E 00,.8626E 00,.8687E 00,.8815E 00,
> .8921E 00,.9012E 00,.9090E 00,.9200E 00,.9326E 00,.9414E 00,
> .9491E 00,.9611E 00,.9701E 00,.9772E 00,.9826E 00,.9868E 00,
> .9900E 00,.9945E 00,.9970E 00,.9985E 00,.9992E 00,.9990E 00,
> .9998E 00,.9999E 00,.1000E 01,.1000E 01,.6681E 00,.6942E 00,
> .7136E 00,.7423E 00,.7637E 00,.7809E 00,.7954E 00,.8080E 00,
> .8189E 00,.8288E 00,.8377E 00,.8578E 00,.8731E 00,.8866E 00,
> .8984E 00,.9180E 00,.9338E 00,.9463E 00,.9565E 00,.9717E 00,
> .9819E 00,.9887E 00,.9932E 00,.9958E 00,.9976E 00,.9992E 00,
> .9993E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.5590E 00,.5880E 00,.6115E 00,.6492E 00,
> .6795E 00,.7054E 00,.7281E 00,.7483E 00,.7667E 00,.7846E 00,
> .7990E 00,.8327E 00,.8609E 00,.8847E 00,.9049E 00,.9357E 00,
> .9581E 00,.9732E 00,.9834E 00,.9941E 00,.9980E 00,.9992E 00,
> .9995E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .4437E 00,.4870E 00,.5222E 00,.5791E 00,.6252E 00,.6628E 00,
> .6985E 00,.7290E 00,.7562E 00,.7854E 00,.8029E 00,.8498E 00/
DATA AS/ .8868E 00,.9155E 00,.9379E 00,.9678E 00,.9843E 00,.9928E
> 00, .9969E 00,.9992E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.2771E 00,.3405E 00,
> .3962E 00,.4925E 00,.5748E 00,.6460E 00,.7076E 00,.7608E 00,
> .8061E 00,.8442E 00,.8761E 00,.9333E 00,.9663E 00,.9840E 00,
> .9928E 00,.9986E 00,.9993E 00,.9999E 00,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1291E 00,.2223E 00,.3261E 00,.5370E 00,
> .7145E 00,.8407E 00,.9187E 00,.9617E 00,.9833E 00,.9932E 00,
> .9973E 00,.9992E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .8143E 00,.8276E 00,.8372E 00,.8509E 00,.8607E 00,.8685E 00,
> .8749E 00,.8803E 00,.8850E 00,.8892E 00,.8930E 00,.9009E 00,
> .9048E 00,.9131E 00,.9180E 00,.9261E 00,.9328E 00,.9380E 00,
> .9436E 00,.9515E 00,.9581E 00,.9645E 00,.9683E 00,.9722E 00/
DATA AT/ .9757E 00,.9813E 00,.9856E 00,.9882E 00,.9916E 00,.9936E
> 00, .9964E 00,.9973E 00,.9986E 00,.9993E 00,.7351E 00,.7552E 00,
> .7698E 00,.7909E 00,.8062E 00,.8182E 00,.8283E 00,.8367E 00,
> .8442E 00,.8466E 00,.8568E 00,.8695E 00,.8800E 00,.8890E 00,
> .8952E 00,.9099E 00,.9206E 00,.9295E 00,.9391E 00,.9500E 00,
> .9597E 00,.9676E 00,.9739E 00,.9785E 00,.9832E 00,.9893E 00,
> .9933E 00,.9959E 00,.9976E 00,.9986E 00,.9988E 00,.9993E 00,
> .9998E 00,.1000E 01,.6533E 00,.6787E 00,.6977E 00,.7258E 00,
> .7468E 00,.7637E 00,.7778E 00,.7901E 00,.8009E 00,.8107E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .8195E 00,.8385E 00,.8543E 00,.8680E 00,.8799E 00,.8998E 00,
> .9159E 00,.9294E 00,.9406E 00,.9579E 00,.9704E 00,.9795E 00,
> .9859E 00,.9907E 00,.9939E 00,.9973E 00,.9990E 00,.9989E 00,
> .9996E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .5346E 00,.5625E 00,.5850E 00,.6211E 00,.6503E 00,.6752E 00,
> .6972E 00,.7169E 00,.7348E 00,.7512E 00,.7664E 00,.7979E 00,
> .8288E 00,.8563E 00,.8749E 00,.9096E 00,.9355E 00,.9549E 00,
> .9690E 00,.9862E 00,.9944E 00,.9977E 00,.9992E 00,.9992E 00,
> .9997E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.4159E 00,.4567E 00/
DATA AU/ .4898E 00,.5434E 00,.5870E 00,.6243E 00,.6570E 00,.6864E
> 00, .7092E 00,.7373E 00,.7594E 00,.8073E 00,.8465E 00,.8788E 00,
> .9048E 00,.9431E 00,.9673E 00,.9820E 00,.9905E 00,.9977E 00,
> .9992E 00,.9997E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.2448E 00,.3011E 00,.3507E 00,.4374E 00,
> .5127E 00,.5794E 00,.6387E 00,.6915E 00,.7383E 00,.7795E 00,
> .8147E 00,.8848E 00,.9315E 00,.9610E 00,.9788E 00,.9944E 00,
> .9985E 00,.9990E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .9490E-01,.1655E 00,.2472E 00,.4257E 00,.5953E 00,.7377E 00,
> .8409E 00,.9094E 00,.9514E 00,.9753E 00,.9881E 00,.9984E 00,
> .9993E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.8071E 00,.8204E 00,
> .8298E 00,.8435E 00,.8531E 00,.8607E 00,.8672E 00,.8725E 00,
> .8771E 00,.8781E 00,.8850E 00,.8930E 00,.8995E 00,.9050E 00/
DATA AV/ .9098E 00,.9180E 00,.9246E 00,.9303E 00,.9352E 00,.9436E
> 00, .9501E 00,.9556E 00,.9617E 00,.9647E 00,.9683E 00,.9744E 00,
> .9792E 00,.9831E 00,.9863E 00,.9882E 00,.9928E 00,.9943E 00,
> .9964E 00,.9990E 00,.7242E 00,.7441E 00,.7584E 00,.7792E 00,
> .7943E 00,.8062E 00,.8160E 00,.8244E 00,.8318E 00,.8383E 00,
> .8442E 00,.8568E 00,.8673E 00,.8761E 00,.8838E 00,.8952E 00,
> .9075E 00,.9166E 00,.9243E 00,.9391E 00,.9477E 00,.9561E 00,
> .9631E 00,.9689E 00,.9739E 00,.9816E 00,.9871E 00,.9911E 00,
> .9940E 00,.9959E 00,.9982E 00,.9989E 00,.9988E 00,.9999E 00,
> .6376E 00,.6624E 00,.6809E 00,.7084E 00,.7236E 00,.7453E 00,
> .7592E 00,.7712E 00,.7770E 00,.7913E 00,.8003E 00,.8186E 00,
> .8343E 00,.8477E 00,.8597E 00,.8770E 00,.8960E 00,.9098E 00,
> .9216E 00,.9408E 00,.9552E 00,.9662E 00,.9748E 00,.9813E 00,
> .9862E 00,.9930E 00,.9964E 00,.9982E 00,.9992E 00,.9990E 00,
> .9998E 00,.9999E 00,.1000E 01,.1000E 01,.5086E 00,.5353E 00,
> .5567E 00,.5911E 00,.6190E 00,.6429E 00,.6639E 00,.6829E 00,
> .7002E 00,.7162E 00,.7310E 00,.7641E 00,.7904E 00,.8178E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .8398E 00,.8768E 00,.9062E 00,.9288E 00,.9471E 00,.9718E 00,
> .9858E 00,.9932E 00,.9970E 00,.9986E 00,.9991E 00,.9997E 00/
  DATA AW/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.3873E 00,.4252E 00,.4561E 00,.5062E 00,
> .5471E 00,.5823E 00,.6133E 00,.6412E 00,.6683E 00,.6901E 00,
> .7120E 00,.7596E 00,.7997E 00,.8338E 00,.8630E 00,.9079E 00,
> .9398E 00,.9618E 00,.9764E 00,.9918E 00,.9975E 00,.9992E 00,
> .9993E 00,.9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .2134E 00,.2627E 00,.3062E 00,.3830E 00,.4505E 00,.5112E 00,
> .5664E 00,.6167E 00,.6625E 00,.7040E 00,.7417E 00,.8196E 00,
> .8777E 00,.9196E 00,.9487E 00,.9810E 00,.9936E 00,.9981E 00,
> .9994E 00,.9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.6700E-01,.1182E 00,
> .1791E 00,.3204E 00,.4701E 00,.6098E 00,.7277E 00,.8190E 00,
> .8851E 00,.9300E 00,.9590E 00,.9908E 00,.9983E 00,.9989E 00,
> .9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.7941E 00,.8071E 00,.8164E 00,.8298E 00/
  DATA AX/ .8394E 00,.8469E 00,.8531E 00,.8556E 00,.8630E 00,.8672E
> 00, .8707E 00,.8786E 00,.8850E 00,.8906E 00,.8952E 00,.9032E 00,
> .9098E 00,.9157E 00,.9203E 00,.9285E 00,.9352E 00,.9412E 00,
> .9458E 00,.9501E 00,.9529E 00,.9617E 00,.9659E 00,.9705E 00,
> .9744E 00,.9777E 00,.9831E 00,.9854E 00,.9882E 00,.9947E 00,
> .7050E 00,.7242E 00,.7382E 00,.7584E 00,.7731E 00,.7847E 00,
> .7943E 00,.8025E 00,.8096E 00,.8160E 00,.8217E 00,.8340E 00,
> .8442E 00,.8529E 00,.8604E 00,.8733E 00,.8838E 00,.8928E 00,
> .9006E 00,.9137E 00,.9243E 00,.9333E 00,.9409E 00,.9477E 00,
> .9535E 00,.9631E 00,.9707E 00,.9768E 00,.9816E 00,.9855E 00,
> .9911E 00,.9931E 00,.9959E 00,.9990E 00,.6087E 00,.6323E 00,
> .6500E 00,.6763E 00,.6908E 00,.7115E 00,.7248E 00,.7363E 00,
> .7419E 00,.7556E 00,.7642E 00,.7819E 00,.7970E 00,.8101E 00,
> .8217E 00,.8389E 00,.8578E 00,.8719E 00,.8846E 00,.9053E 00,
> .9217E 00,.9350E 00,.9463E 00,.9556E 00,.9635E 00,.9757E 00,
> .9839E 00,.9897E 00,.9935E 00,.9954E 00,.9985E 00,.9992E 00,
> .9998E 00,.1000E 01,.4609E 00,.4851E 00,.5045E 00,.5358E 00,
> .5611E 00,.5829E 00,.6022E 00,.6197E 00,.6357E 00,.6505E 00,
> .6643E 00,.6956E 00,.7209E 00,.7476E 00,.7698E 00,.8086E 00/
  DATA AY/ .8417E 00,.8686E 00,.8920E 00,.9283E 00,.9536E 00,.9709E
> 00, .9823E 00,.9894E 00,.9937E 00,.9981E 00,.9995E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .3359E 00,.3688E 00,.3957E 00,.4394E 00,.4751E 00,.5061E 00,
> .5336E 00,.5586E 00,.5829E 00,.6029E 00,.6229E 00,.6678E 00,
> .7071E 00,.7418E 00,.7731E 00,.8259E 00,.8678E 00,.9011E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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> .9272E 00,.9633E 00,.9828E 00,.9919E 00,.9962E 00,.9986E 00,
> .9995E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1628E 00,.2005E 00,
> .2340E 00,.2936E 00,.3469E 00,.3958E 00,.4414E 00,.4842E 00,
> .5245E 00,.5625E 00,.5984E 00,.6790E 00,.7479E 00,.8050E 00,
> .8525E 00,.9203E 00,.9601E 00,.9816E 00,.9921E 00,.9985E 00,
> .9998E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.3335E-01,.5966E-01,.9211E-01,.1735E 00,
> .2716E 00,.3792E 00,.4885E 00,.5918E 00,.6846E 00,.7639E 00,
> .8284E 00,.9314E 00,.9764E 00,.9921E 00,.9975E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01/
DATA AZ/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01,.7850E 00,.7979E 00,.8071E 00,.8204E 00,.8298E 00,.8372E 00,
> .8435E 00,.8486E 00,.8531E 00,.8540E 00,.8607E 00,.8685E 00,
> .8749E 00,.8803E 00,.8850E 00,.8930E 00,.8995E 00,.9050E 00,
> .9098E 00,.9180E 00,.9246E 00,.9303E 00,.9352E 00,.9399E 00,
> .9436E 00,.9501E 00,.9556E 00,.9617E 00,.9647E 00,.9683E 00,
> .9744E 00,.9769E 00,.9813E 00,.9882E 00,.6916E 00,.7105E 00,
> .7242E 00,.7440E 00,.7584E 00,.7698E 00,.7792E 00,.7872E 00,
> .7943E 00,.8005E 00,.8062E 00,.8182E 00,.8283E 00,.8367E 00,
> .8442E 00,.8568E 00,.8673E 00,.8761E 00,.8838E 00,.8952E 00,
> .9075E 00,.9166E 00,.9243E 00,.9312E 00,.9391E 00,.9477E 00,
> .9561E 00,.9631E 00,.9689E 00,.9739E 00,.9816E 00,.9846E 00,
> .9893E 00,.9959E 00,.5876E 00,.6105E 00,.6276E 00,.6529E 00,
> .6669E 00,.6870E 00,.6998E 00,.7109E 00,.7163E 00,.7295E 00,
> .7379E 00,.7550E 00,.7697E 00,.7824E 00,.7937E 00,.8106E 00,
> .8292E 00,.8431E 00,.8554E 00,.8764E 00,.8936E 00,.9081E 00,
> .9207E 00,.9322E 00,.9414E 00,.9567E 00,.9679E 00,.9766E 00,
> .9839E 00,.9883E 00,.9947E 00,.9965E 00,.9981E 00,.9998E 00,
> .4262E 00,.4485E 00,.4665E 00,.4955E 00,.5190E 00,.5392E 00/
DATA BA/ .5572E 00,.5734E 00,.5884E 00,.6022E 00,.6152E 00,.6447E
> 00,.6689E 00,.6945E 00,.7160E 00,.7543E 00,.7876E 00,.8162E 00,
> .8421E 00,.8851E 00,.9171E 00,.9425E 00,.9609E 00,.9739E 00,
> .9829E 00,.9933E 00,.9976E 00,.9989E 00,.9997E 00,.9999E 00,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.2994E 00,.3288E 00,
> .3527E 00,.3918E 00,.4238E 00,.4516E 00,.4764E 00,.4990E 00,
> .5211E 00,.5394E 00,.5578E 00,.5996E 00,.6368E 00,.6706E 00,
> .7015E 00,.7556E 00,.8020E 00,.8416E 00,.8746E 00,.9251E 00,
> .9579E 00,.9776E 00,.9884E 00,.9947E 00,.9975E 00,.9994E 00,
> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1309E 00,.1612E 00,.1883E 00,.2366E 00,
> .2801E 00,.3206E 00,.3588E 00,.3952E 00,.4300E 00,.4635E 00,
> .4958E 00,.5713E 00,.6400E 00,.7018E 00,.7565E 00,.8450E 00,
> .9075E 00,.9481E 00,.9725E 00,.9934E 00,.9981E 00,.9996E 00,

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0 1 2 3 4 5 6 7
123456789012345678901234567890123456789012345678901234567890123456789012

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> .9999E 00,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1903E-01,.3428E-01,.5345E-01,.1034E 00,.1678E 00,.2443E 00,
> .3296E 00,.4194E 00,.5092E 00,.5953E 00,.6741E 00,.8284E 00,
> .9204E 00,.9661E 00,.9875E 00,.9984E 00,.9998E 00,.1000E 01/
DATA BB/ .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E
> 01, .1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,.1000E 01,
> .1000E 01,.1000E 01,.1000E 01,.1000E 01/
DO 30 L=8,13
    DO 20 K=1,7
        DO 10 I=1,34
10             REFA(I,K,L)=SEFA(I,K,L)
20             CONTINUE
30             CONTINUE
        RETURN
    END
C*****
C*****
SUBROUTINE RVALUE (IFLAG,MODE,I,NO,NR,R)
COMMON /RVAL/ S1,S3,SD1,SD3,ACN,GCN,SW1,SW3
COMMON /OCOM/ NNUCS,ANLAM(36),RR,SQSD,ACON(36,20,
> 20),GCON(36,20,20),LIPO,NOMM(36,11),NRMM(36,11),ORMODI(36,12,8),
> VD(36),VDCOEF(20,20),NOL,NOU,NRL,NRU
COMMON /OCOMCHAR/ NAMNUC(36),WORD
CHARACTER*8 NAMNUC,WORD
C THIS SUBROUTINE ASSIGNS A VALUE TO THE PARAMETER
C R = THE FRACTION OF DEPOSITED ACTIVITY RETAINED ON CROPS (DIMENSION
C AS FOLLOWS..
C (1) IF THE VALUES USED FOR S1 AND S3 ARE NOT NUCLIDE-SPECIFIC (NORMAL
C IFLAG=0), THEN
C     R = S1 FOR VEGETABLES (MODE=1)
C     R = S3 FOR PASTURE (MODE=2)
C (2) IF VALUES FOR S1 AND S3 ARE NUCLIDE-SPECIFIC, AND DEPOSITION RATES
C ARE NOT SPECIFIED SEPARATELY FOR WET AND DRY DEPOSITION (SPECIAL R
C IFLAG=1), THEN
C     R = SD1 FOR VEGETABLES (MODE=1)
C     R = SD3 FOR PASTURE (MODE=2)
C (3) IF VALUES FOR S1 AND S3 ARE NUCLIDE-SPECIFIC, AND DEPOSITION RATES
C ARE SPECIFIED SEPARATELY FOR WET AND DRY DEPOSITION (IFLAG=2), THE
C R IS CALCULATED BY AVERAGING DRY AND WET DEPOSITION RATES AS FOLLO
C
C     R =(SD1*DRY DEP RATE + SW1*WET DEP RATE) /(DRY DEP RATE+WET DEP
C FOR VEGETABLES (MODE = 1).
C
C     R=(SD3*DRY DEP RATE + SW3*WET DEP RATE)/ (DRY DEP RATE + WET DEP RATE)
C FOR PASTURE (MODE = 2)

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AIRDOS-EPA (AIRDOS2.FOR) Program File
(continued)

0	1	2	3	4	5	6	7
<u>12345678901234567890123456789012345678901234567890123456789012</u>							

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      IF (IFLAG.EQ.0.AND.MODE.EQ.1) R=S1
      IF (IFLAG.EQ.0.AND.MODE.EQ.2) R=S3
      IF (IFLAG.EQ.1.AND.MODE.EQ.1) R=SD1
      IF (IFLAG.EQ.1.AND.MODE.EQ.2) R=SD3
C CALCULATE DRY AND WET DEPOSITION RATES.
      DRYDEP = ACN*VD(I)*VDCOEF(NO,NR)
      WETDEP = GCN - DRYDEP
C THE SUM OF THESE DEPOSITION RATES IS GIVEN BY GCN.
      IF (IFLAG.EQ.2.AND.MODE.EQ.1) R= (SD1*DRYDEP+SW1*WETDEP)/ GCN
      IF (IFLAG.EQ.2.AND.MODE.EQ.2) R= (SD3*DRYDEP+SW3*WETDEP)/ GCN
C PRINT ERROR MESSAGE IF NONE OF THESE CONDITIONS IS MET.
      IF (MODE.NE.1.AND.MODE.NE.2) WRITE(6,9000)
      IF (IFLAG.NE.0.AND.IFLAG.NE.1.AND.IFLAG.NE.2) WRITE(51,9001)
      RETURN
9000 FORMAT('OERROR.. MODE SHOULD BE 1 OR 2 IN SUBROUTINE RVALUE')
9001 FORMAT('OERROR.. IFLAG SHOULD BE 0,1,OR 2 IN SUBROUTINE RVALUE')
      END

```