APPENDIX J

SAMPLE.SYNOPSIS FILES

SAMPLE.SYNOPSIS Files
Non-Radon Run

```
PLEASE GIVE TO ===> BARRY PARKS
PHONE NUMBER: (702) 798-2443
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SAMPLE.SYNOPSIS Files
Non-Radon Run
(continued)

SYNOPSIS REPORT - CAP-88 (1.00)

ID Code: DOE_ARGONNEP Date/Time: THR 7 September, 1989 12:05:43 PM

Facility: ARGONNE NATIONAL LABORATORY
Address: ADDRESS
City: ARGONNE
State: IL Zipcode:

Source Category: DOE FACILITIES Source Term: 1986

Comments:
ARGONNE NATIONAL LAB, IL UNIV. OF CHICAGO POP RUN

POPULATION ASSESSMENT
(RN-222 DOSE/RISK EXCLUDED)

ICRP Collective Effective Dose Equivalent (Person-Rem/Year): 3.07E-01

Collective Population

	GONADS	BREAST	R MAR	LUNGS	THYROID	ENDOST	RMNDR
Organ dose (P-REM/YR) :	3.1E-01	3.0E-01	2.8E-01	3.3E-01	3.5E-01	2.7E-01	3.1E-01

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

RISK	NUMBER OF PEOPLE	NUMBER OF PEOPLE AT THIS RISK OR HIGHER	DEATHS/YEAR AT THIS RISK	DEATHS/YEAR AT THIS RISK OR HIGHER
1.0E+00 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 1.0E-06	0	0	0.00E+00	0.00E+00
LESS THAN 1.0E-06	7893815	7893815	1.13E-04	1.13E-04

INDIVIDUAL AT MAXIMUM RISK ASSESSEMENT
(RN-222 RISKS EXCLUDED)

Location to the individual: 750 METERS SOUTH SOUTHWEST

	GONADS	BREAST	R MAR	LUNGS	THYROID	ENDOST	RMNDR
Organ dose (mrem/yr) :	2.6E-03	2.5E-03	2.8E-03	3.1E-02	2.5E-03	2.1E-02	2.7E-03

ICRP Effective Dose Equivalent (mrem/yr): 6.59E-03
Lifetime Fatal Cancer Risk : 1.39E-07

SOURCE TERM (1986)

SAMPLE.SYNOPSIS Files
Non-Radon Run
(continued)

ID CODE: DOE_ARGONNEP DATE/TIME:THR 7 September, 1989 12:05:43 PM PAGE 2

Nuclide	Class	Amad	Stack #1 Ci/yr	TOTAL
AR-41	*	0.00	1.46E+00	1.46E+00
C-11	D	1.00	9.00E+01	9.00E+01
CS-134	D	1.00	2.04E-07	2.04E-07
CS-137	D	1.00	4.95E-07	4.95E-07
BA-137M	D	1.00	0.00E+00	0.00E+00
H-3	*	0.00	5.03E+01	5.03E+01
I-129	D	1.00	1.61E-05	1.61E-05
I-131	D	1.00	1.52E-06	1.52E-06
KR-85	*	0.00	1.70E+00	1.70E+00
NB-95	Y	1.00	1.55E-08	1.55E-08
PU-239	Y	1.00	5.61E-09	5.61E-09
RN-220	*	0.00	6.98E+03	6.98E+03
SB-125	W	1.00	3.38E-05	3.38E-05
ZR-95	W	1.00	7.50E-09	7.50E-09

SITE INFORMATION

Temperature: 10 C
Rainfall: 80 cm/yr
Mixing Height: 700 meters

EMISSION INFORMATION

Stack Number: 1

Stack Height (meters) : 61.00
Stack Diameter (meters): 0.00
Plume Rise
Momentum (m/sec) :0.00E+00

FOOD SUPPLY FRACTIONS

	Local	Regional	Imported
Vegetable:	0.076	0.924	0.000
Meat:	0.008	0.992	0.000
Milk:	0.000	1.000	0.000

FOOD FRACTIONS USED: DB = 3.33E-01 DM = 2.16E-02 FC = 2.80E-02

POPULATION ARRAY (1980 Census)

	250	750	1500	2500	3500	4500	7500
N	0.	0.	0.	2070.	514.	3434.	25640.
NNW	0.	0.	0.	0.	3283.	4172.	17450.
NW	0.	0.	0.	0.	0.	1925.	16327.
WNW	0.	0.	0.	421.	0.	0.	15766.
W	0.	0.	0.	0.	0.	3832.	10282.
WSW	0.	0.	0.	0.	757.	0.	18479.

SAMPLE.SYNOPSIS Files
Non-Radon Run
(continued)

ID CODE: DOE_ARGONNEP DATE/TIME:THR 7 September, 1989 12:05:43 PM PAGE 3

	250	750	1500	2500	3500	4500	7500
SW	0.	0.	0.	0.	0.	583.	699.
SSW	0.	371.	0.	0.	0.	754.	3388.
S	0.	0.	0.	0.	0.	0.	11255.
SSE	0.	0.	0.	0.	0.	0.	1524.
SE	0.	0.	0.	0.	0.	0.	1400.
ESE	0.	0.	0.	0.	0.	9.	543.
E	0.	0.	0.	2877.	0.	626.	0.
ENE	0.	0.	0.	0.	549.	807.	7362.
NE	0.	0.	0.	899.	1493.	1477.	6039.
NNE	0.	0.	0.	1245.	4758.	3299.	18169.

	15000	25000	35000	45000	55000	70000
N	79915.	108628.	137641.	198337.	58920.	239266.
NNW	76995.	81605.	153849.	53208.	59104.	111910.
NW	31050.	38804.	39953.	63051.	4973.	21218.
WNW	40030.	32245.	29235.	4906.	2527.	52311.
W	15628.	64259.	34322.	5686.	9600.	6945.
WSW	3255.	3927.	1759.	1552.	2745.	5894.
SW	14087.	25526.	3013.	2211.	11628.	13569.
SSW	25583.	92779.	6919.	6218.	14385.	9580.
S	3057.	17399.	3386.	1227.	3539.	69888.
SSE	1560.	20196.	2956.	3162.	6812.	21119.
SE	38264.	55616.	129090.	26537.	13264.	28396.
ESE	42042.	148331.	186756.	195779.	202379.	109332.
E	110559.	390640.	316868.	23367.	0.	27418.
ENE	85258.	426648.	343806.	0.	0.	0.
NE	104299.	548998.	884496.	132440.	0.	0.
NNE	72950.	210212.	312502.	221810.	53208.	3020.

REFERENCE FILE NAMES FOR ASSESSMENT

```
JCL FILE     ===> CAAR.CAA88.DOE(ARGONNEP)
ALLRAD FILE  ===> CBNRACS.CAA88.DATA(ALLRAD88)
POP FILE     ===> CAAR.CAA88.POPLIB(ARGONNE)
STARFILE     ===> CAAR.CAA88.STARLIB(MDW0675)
PREDA FILE   ===> CAAR.AIRDOS.LIB(JOAPOP)
RADRISK FILE ===> CBNRACS.CAA88.RADRISK.V8401RBM
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SAMPLE.SYNOPSIS Files
Non-Radon Run
(continued)

ID CODE: DOE_ARGONNEP DATE/TIME:THR 7 September, 1989 12:05:43 PM PAGE 4

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

RISK	NUMBER OF PEOPLE	NUMBER OF PEOPLE AT THIS RISK OR HIGHER	DEATHS/YEAR AT THIS RISK	DEATHS/YEAR AT THIS RISK OR HIGHER
1.0E+00 TO 3.0E-01	0	0	0.00E+00	0.00E+00
3.0E-01 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 3.0E-02	0	0	0.00E+00	0.00E+00
3.0E-02 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 3.0E-03	0	0	0.00E+00	0.00E+00
3.0E-03 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 3.0E-04	0	0	0.00E+00	0.00E+00
3.0E-04 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 3.0E-05	0	0	0.00E+00	0.00E+00
3.0E-05 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 3.0E-06	0	0	0.00E+00	0.00E+00
3.0E-06 TO 1.0E-06	0	0	0.00E+00	0.00E+00
1.0E-06 TO 3.0E-07	0	0	0.00E+00	0.00E+00
3.0E-07 TO 1.0E-07	371	371	7.30E-07	7.30E-07
LESS THAN 1.0E-07	7893444	7893815	1.12E-04	1.13E-04

SAMPLE.SYNOPSIS Files
Radon Run

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PLEASE GIVE TO ===> LARRY GRAY
PHONE NUMBER: 475-9610
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SAMPLE.SYNOPSIS Files
Radon Run
(continued)

SYNOPSIS REPORT - CAP-88 (1.00)

ID Code: SUMINERN_DARPIT1P Date/Time: THR 11 May, 1989 8:53:28 PM

Facility: DARROW PIT #1
Address: ADDRESS
City: FALL RIVER COUNTY
State: SD Zipcode:

Source Category: SURFACE URANIUM MINES RADON Source Term: 1986

Comments:
DARROW PIT #1, FALL RIVER COUNTY, SOUTH DAKOTA -- POP RUN

RN-222 POPULATION ASSESSMENT

Collective Exposure (Person Working Levels): 2.03E-04

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

RISK	NUMBER OF PEOPLE	NUMBER OF PEOPLE AT THIS RISK OR HIGHER	DEATHS/YEAR AT THIS RISK	DEATHS/YEAR AT THIS RISK OR HIGHER
1.0E+00 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 1.0E-06	0	0	0.00E+00	0.00E+00
LESS THAN 1.0E-06	24163	24163	3.87E-06	3.87E-06

RN-222 EXPOSURE AND RISK FOR THE INDIVIDUAL AT MAXIMUM RISK

Location to the individual: 4000 METERS SOUTH SOUTHEAST

Exposure in Working Levels: 1.65E-07
pCi/liter at that location: 3.98E-05
Lifetime Fatal Cancer Risk: 2.26E-07

SOURCE TERM (1986)

Nuclide	Class	Amad	Stack #1 Ci/yr	TOTAL
RN-222	*	0.00	5.40E+00	5.40E+00

SITE INFORMATION

Temperature: 8 C
Rainfall: 48 cm/yr
Mixing Height: 1000 meters

SAMPLE.SYNOPSIS Files
Radon Run
(continued)

ID CODE: SUMINERN_DARPIT1P DATE/TIME:THR 11 May, 1989 8:53:28 PM PAGE 2

EMISSION INFORMATION

Stack Number: 1

Area Height (meters) : 1.00
Area (sq. m) : 5.83E+04
Area Diameter (meters): 2.72E+02

FOOD SUPPLY FRACTIONS

	Local	Regional	Imported
Vegetable:	0.076	0.924	0.000
Meat:	0.008	0.992	0.000
Milk:	0.000	1.000	0.000

FOOD ARRAYS WERE NOT GENERATED OR SUPPLIED FOR THIS RUN. DEFAULT VALUES USED.

POPULATION ARRAY (1980 Census)

	250	750	1500	2500	4000	7500	15000
N	0.	0.	0.	0.	0.	0.	0.
NNW	0.	0.	0.	0.	0.	0.	0.
NW	0.	0.	0.	0.	6.	0.	0.
WNW	0.	0.	0.	0.	1.	0.	0.
W	0.	0.	0.	0.	0.	0.	0.
WSW	0.	0.	0.	0.	15.	0.	0.
SW	0.	0.	0.	0.	0.	0.	0.
SSW	0.	0.	0.	0.	9.	0.	0.
S	0.	0.	0.	0.	3.	0.	0.
SSE	0.	0.	0.	0.	3.	0.	0.
SE	0.	0.	0.	0.	0.	0.	154.
ESE	0.	0.	0.	0.	0.	0.	0.
E	0.	0.	0.	0.	0.	0.	0.
ENE	0.	0.	0.	0.	0.	0.	0.
NE	0.	0.	0.	0.	0.	0.	0.
NNE	0.	0.	0.	0.	0.	0.	0.

	25000	35000	45000	55000	70000
N	0.	0.	0.	0.	20.
NNW	0.	0.	3600.	0.	1281.
NW	0.	0.	0.	0.	238.
WNW	0.	461.	0.	0.	0.
W	0.	74.	0.	0.	6.
WSW	0.	0.	0.	0.	92.
SW	68.	0.	0.	112.	99.
SSW	0.	0.	0.	103.	0.
S	40.	139.	0.	0.	192.
SSE	1519.	81.	0.	16.	127.
SE	49.	0.	0.	94.	44.
ESE	0.	804.	0.	68.	301.

SAMPLE.SYNOPSIS Files
Radon Run
(continued)

ID CODE: SUMINERN_DARPIT1P DATE/TIME:THR 11 May, 1989 8:53:28 PM PAGE 3

	25000	35000	45000	55000	70000
E	0.	4742.	46.	190.	369.
ENE	0.	124.	0.	0.	491.
NE	0.	1747.	1835.	233.	2496.
NNE	145.	667.	0.	528.	731.

REFERENCE FILE NAMES FOR ASSESSMENT

```
JCL FILE     ===> CAAR.CAA88.SUMINERN(DARPIT1P)
ALLRAD FILE  ===> CBNRACS.CAA88.DATA(ALLRAD88)
STAR FILE    ===> CAAR.CAA88.STARLIB(RAP0336)
POP FILE     ===> CAAR.CAA88.POPLIB(FRCPIT1)
PREDA FILE   ===> CAAR.AIRDOS.LIB(JOAPOP)
RADRISK FILE ===> CBNRACS.CAA88.RADRISK.V8401RBM
```

SAMPLE.SYNOPSIS Files
Radon Run
(continued)

ID CODE: SUMINERN_DARPIT1P DATE/TIME:THR 11 May, 1989 8:53:28 PM PAGE 4

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

RISK	NUMBER OF PEOPLE	NUMBER OF PEOPLE AT THIS RISK OR HIGHER	DEATHS/YEAR AT THIS RISK	DEATHS/YEAR AT THIS RISK OR HIGHER
1.0E+00 TO 3.0E-01	0	0	0.00E+00	0.00E+00
3.0E-01 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 3.0E-02	0	0	0.00E+00	0.00E+00
3.0E-02 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 3.0E-03	0	0	0.00E+00	0.00E+00
3.0E-03 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 3.0E-04	0	0	0.00E+00	0.00E+00
3.0E-04 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 3.0E-05	0	0	0.00E+00	0.00E+00
3.0E-05 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 3.0E-06	0	0	0.00E+00	0.00E+00
3.0E-06 TO 1.0E-06	0	0	0.00E+00	0.00E+00
1.0E-06 TO 3.0E-07	0	0	0.00E+00	0.00E+00
3.0E-07 TO 1.0E-07	22	22	5.25E-08	5.25E-08
LESS THAN 1.0E-07	24141	24163	3.81E-06	3.87E-06

APPENDIX K

SECPOP PROGRAM FILES

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
C     PROGRAM SECPOP, MAGNETIC TAPE VERSION
C     THIS PROGRAM IS AN EXTENSIVELY MODIFIED VERSION OF A PROGRAM
C     DESCRIBED IN THE U. S. DEPT. OF COMMERCE, OFFICE OF TELECOMMUNI-
C     CATIONS, TECHICAL MEMORANDUM 73-146.  IT HAS BEEN TESTED OVER
C     SEVERAL MONTHS UNDER NORMAL OPERATING CONDITIONS, BUT THE USER
C     IS RESPONSIBLE FOR THE FINAL EVALUATION AS TO ITS USEFULLNESS
C     AND VALIDITY IN HIS PARTICULAR APPLICATION.  PLEASE CREDIT THE
C     OFFICE OF TELECOMMUNICATIONS, DEPT. OF COMMERCE, FOR THE
C     PREPARATION OF THE DATA BASE, AND THE OFFICE OF RADIATION
C     PROGRAMS, ENVIRONMENTAL PROTECTION AGENCY, FOR THE PROGRAMS.
C
C     MODIFIED TO POSITION FILE AT RECORD NREC-1 BEFORE READING DATA FOR
C     RECORD NREC.  REVISED VERSION OF SUBROUTINE RECORD INCORPORATED.
C     C.B.NELSON JULY 25, 1983.
C
      DIMENSION LONPOS(2136),A(3600)
      DIMENSION ANUM(17,21), CIRCLE(21), POPTOT(17,21), HSTOT(17,21)
      DIMENSION ISEC(16),JSEC(16),XISEC(16),XJSEC(16)
      DIMENSION LON(720),LAT(720),IS(720),IC(720),IH(720),IP(720)
      COMMON LONPOS
      REAL*8 NAME(3)
      REAL LONPOS, LAT, LON, INCR, LONI
      REAL POP(20,20)
      INTEGER ANUM, POPTOT, HSTOT
      INTEGER*2 IS,IC
      EQUIVALENCE (A(1),LON(1)),(A(721),LAT(1)),(A(1441),IS(1)),
     >  (A(1801),IC(1)),(A(2161),IH(1)),(A(2881),IP(1))
      DIST(DLAT,DLON,COSSQ)= 111.19528*SQRT(DLAT*DLAT +
     1     DLON*DLON*COSSQ)
      IDATAU=9
C     DATA SET IDATAU HAS FODT FILE
      PI=3.1415926
      CONV=PI/180.
      ERAD=6371.0200
C     EARTH'S RADIUS = ERAD (KM)
      RN= 1.4473133
      NREC=1
      M=1
      READ (IDATAU) LONPOS
C     LONPOS HAS INITIAL LONGITUDES OF EACH OF THE 2136 RECORDS
C     READ IN NEW CENTERPOINT
10    READ 103, NAME, A1, A2, A3, A4, A5, A6, RADIUS,
     1     INCR, XSEC, OFFSET
C     COL.  1-24  ALPHAMERIC ID OF CENTERPOINT
C           25-28  BLANK
```

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
C          29-39  DEGREES, MINUTES, SECONDS OF LATTITUDE
C          40-50  DEGREES, MINUTES, SECONDS OF LONGITUDE
C          51-56  RADIUS OF LARGEST OF CONCENTRIC CIRCLES
C          57-62  RADIUS INCREMENT (KM)
C          63-67  NUMBER OF SECTORS
C          68-72  SECTOR OFFSET IN DEGREES
      IF (XSEC.EQ.0.) XSEC=1.
C     WHEN SECTOR FIELD IS BLANK, USE FULL CIRCLE
      NSEC=XSEC
      MSEC=360/NSEC
      XMSEC=360./XSEC
      YMSEC=MSEC
      ISW=0
      IF (XMSEC.NE.YMSEC.OR.OFFSET.NE.0..OR.NSEC.GT.12) ISW=1
      IF (XSEC.GT.16) GO TO 25
      NBINS =0
C     WHEN NBINS=0, CIRCLES ARE COMPUTED FROM RADIUS, INCR
C     WHEN NBINS.NE.0 (IE. WHEN RADIUS=99999.9), CIRCLES ARE READ IN:
      IF (RADIUS.NE.99999.9) GO TO 2
      NBINS=INCR
      NRADS=NBINS
      READ 106, (CIRCLE(N),N=1,NBINS)
106   FORMAT (7F10.2)
      RADIUS=CIRCLE(NBINS)
2     IF (A1.EQ.0.) GO TO 23
C     END OF PROGRAM ON BLANK CARD
      AL= A1 + A2/60. + A3/3600.
      OL = A4 + A5/60. + A6/3600.
C     LATITUDE AND LONGITUDE TO DEGREES AND FRACTIONS
      PRINT 101,NAME,AL,OL,NSEC
      ALR = AL*CONV
C     LATITUDE TO RADIANS
      RN = RADIUS/(ERAD*CONV)
      COSA = COS(ALR)
      RNSECA = RN/COSA + .01
C     RNSECA IS LONGITUDE (DIFFERENCE) CORRESPONDING TO ONE
C           RADIUS (EAST-WEST)
      ALONMX = OL + RNSECA
C     WESTERN BOUNDARY FOR SQUARE AROUND RADIUS CIRCLE
      XLON = OL - RNSECA
C     EASTERN BOUNDARY ETC.
      CALL RECORD(XLON,NREC)
      IF (LONPOS(NREC).GT.XLON) NREC = NREC - 1
      IF (NREC.GT.2136) GO TO 23
      NREC = (NREC-1)/6 + 2
```

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
      CALL RECPOS(M,NREC-1,IDATAU)
      M=NREC-1
      IF (INCR.EQ.0.) GO TO 4
      IF (NBINS.NE.0) GO TO 3
      AF1 = RADIUS/INCR
      NRADS = AF1
      AF2 = NRADS
      IF (AF1.NE.AF2) NRADS = NRADS + 1
      IF (NRADS.GT.20) GO TO 25
4     IF (INCR.EQ.0.) NRADS = 1
      DO 5 I = 1,NRADS
5     CIRCLE(I) = INCR*FLOAT(I)
      CIRCLE(NRADS) = RADIUS
3     DO 6 I=1,NSEC
      IF (ISW.EQ.1) GO TO 7
      ISEC(I)=(I-1)*MSEC
      JSEC(I)=I*MSEC
      GO TO 8
7     XISEC(I)=XMSEC*FLOAT(I-1) -OFFSET
      XJSEC(I)=XMSEC*FLOAT(I) - OFFSET
8     DO 6 J = 1, NRADS
      POPTOT(I,J) = 0
      HSTOT(I,J) = 0
6     ANUM(I,J) = 0
C     SELECT CENSUS ENUMERATION DISTRICTS (CEDS)
32    READ (IDATAU,ERR=26) A
C     IS AND IC ARE DUMMY VARIABLES
      M= M+ 1
      DO 19 I = 1, 720
      LONI = LON(I)
      IF (LONI.GT.ALONMX) GO TO 20
      IF (LONI.LT.XLON) GO TO 19
      DLAT = LAT(I)-AL
      IF (ABS(DLAT).GT.RN) GO TO 19
      DLON = LONI - OL
      COSSQ=COSA*COS(LAT(I)*CONV)
      D = DIST(DLAT, DLON, COSSQ)
      IF (D.GT.RADIUS) GO TO 19
C     NEXT 9 LINES PART OF ANGLE COMPUTATION
C     THETA IS FINALLY IN DEGREES EAST OF NORTH (0-360)
      IF (DLAT) 12,11,13
11    DLAT = -1E-70
12    THETA = PI
      GO TO 16
13    IF (-DLON) 14, 15, 15
```

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567 8

14    THETA = 6.283185
      GO TO 16
15    THETA = 0.
16    THETA = (THETA + ATAN(-DLON*SQRT(COSSQ)/DLAT))/CONV + OFFSET
      DO 17 J=1,NRADS
      IF (D.LE.CIRCLE(J)) GO TO 18
17    CONTINUE
18    JA = THETA*XSEC/360. + 1.
      IF (JA.EQ.(NSEC+1)) JA=1
      POPTOT(JA,J) = POPTOT(JA,J) + IP(I)
      HSTOT(JA,J) = HSTOT(JA,J) + IH(I)
      ANUM(JA,J) = ANUM(JA,J) + 1
19    CONTINUE
      GO TO 32
20    PRINT 107
C     CALCULATE MARGINAL TOTALS
      NSEC1=NSEC+1
      NRAD1=NRADS+1
      CIRCLE(NRAD1)=RADIUS
      DO 121 I=1,NSEC1
      ANUM(I,NRAD1)=0.
      POPTOT(I,NRAD1)=0.
  121 HSTOT(I,NRAD1)=0.
      DO 122 J=1,NRADS
      ANUM(NSEC1,J)=0.
      POPTOT(NSEC1,J)=0.
  122 HSTOT(NSEC1,J)=0.
      DO 124 I=1,NSEC
      DO 123 J=1,NRADS
      ANUM(I,NRAD1)=ANUM(I,NRAD1)+ANUM(I,J)
      ANUM(NSEC1,J)=ANUM(NSEC1,J)+ANUM(I,J)
      POPTOT(I,NRAD1)=POPTOT(I,NRAD1)+POPTOT(I,J)
      POPTOT(NSEC1,J)=POPTOT(NSEC1,J)+POPTOT(I,J)
      HSTOT(I,NRAD1)=HSTOT(I,NRAD1)+HSTOT(I,J)
  123 HSTOT(NSEC1,J)=HSTOT(NSEC1,J)+HSTOT(I,J)
      ANUM(NSEC1,NRAD1)=ANUM(NSEC1,NRAD1)+ANUM(I,NRAD1)
      POPTOT(NSEC1,NRAD1)=POPTOT(NSEC1,NRAD1)+POPTOT(I,NRAD1)
  124 HSTOT(NSEC1,NRAD1)=HSTOT(NSEC1,NRAD1)+HSTOT(I,NRAD1)
C   FLOAT AND TRANSPOSE POPULATION MATRIX FOR AIRDOS-EPA FORMAT
      DO 132 J=1,20
      JM=MOD(NSEC+1-J,NSEC)+1
      DO 132 I=1,20
      IF(J.GT.NSEC.OR.I.GT.NRADS) GO TO 130
      POP(I,J)=POPTOT(JM,I)
      GO TO 132
```

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
  130 POP(I,J)=0.
  132 CONTINUE
C
      PUNCH 133, NAME,AL,OL,NSEC,NRADS
  133 FORMAT('$ ',3A8,1X,'LAT=',F8.4,1X,'LON=',F8.4,1X,
     >       'NSEC=',I2,1X,'NRADS=',I2)
      PUNCH 1331, (CIRCLE(I),I=1,NRADS)
 1331 FORMAT(8F10.1)
      PUNCH 134, POP
  134 FORMAT(8F10.0)
C
      IF (ISW.EQ.1) GO TO 41
      PRINT 104,(ISEC(K),JSEC(K),K=1,NSEC)
      DO 22 N=1,NRAD1
      PRINT 102, CIRCLE(N),(ANUM(K,N),K=1,NSEC1)
102   FORMAT (/,1H ,F8.2,1X,13I9)
      PRINT 112,(HSTOT(K,N),K=1,NSEC1)
22    PRINT 112,(POPTOT(K,N),K=1,NSEC1)
112   FORMAT (1H ,9X,13I9)
      GO TO 10
41    PRINT 204,(XISEC(K),K=1,NSEC)
204   FORMAT ('    KM    ', 1X, 16(F6.1,'-'))
      PRINT 205,(XJSEC(K),K=1,NSEC)
205   FORMAT (10X,16F7.1)
      DO 42 N=1,NRAD1
      PRINT 202, CIRCLE(N),(ANUM(K,N),K=1,NSEC1)
202   FORMAT (/,1H ,F8.2,1X,16I7,I9)
      PRINT 212, (HSTOT(K,N),K=1,NSEC1)
42    PRINT 212, (POPTOT(K,N),K=1,NSEC1)
212   FORMAT (1H ,9X,16I7,I9)
      GO TO 10
101   FORMAT (1H1,3A8,6H   LAT,F9.4,7H    LON,F10.4,11H   SECTORS=,I3)
103   FORMAT (3A8,4X,2(F5.0,2F3.0),2F6.1,3F5.1)
107   FORMAT (11H  RADIUS IN,5X,31HCEDS, HOUSING UNITS, POPULATION,
     1     41H WITHIN SECTORS, WHOLE CIRCLE (LAST COL.)/ )
104   FORMAT (12H    KM       ,1X,12(I4,1H-,I3,1X))
111   FORMAT (22H   TOO MANY INCREMENTS)
25    PRINT 111
      GO TO 10
26    PRINT 105
105   FORMAT (22H0I/O ERROR, NEXT POINT)
      GO TO 10
23    STOP
      END
      SUBROUTINE RECPOS(NA,NB,IDATA)
```

```
0         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
C     POSITION TAPE FROM RECORD NA TO RECORD NB IN DATASET IDATA
      NUM = NB - NA
      IF (NUM) 10, 40, 30
10    NUM = -NUM
      DO 11 I = 1, NUM
11    BACKSPACE IDATA
      GO TO 40
30    DO 32 I = 1, NUM
32    READ (IDATA)
40    RETURN
      END
      SUBROUTINE RECORD(LON,K)
C
C...  DETERMINE FIRST RECORD FOR PROCESSING.  ENTER WITH LON;
C...  ON RETURN, LONPOS(K).LT.LON.LE.LONPOS(K+1).
C...  C.B.NELSON 7/6/83
C
      COMMON LONPOS(2136)
      REAL*4 LONPOS,LON
      INTEGER MM/2136/,II/12/
C
      L=1
      M=MM
      IF(LONPOS(L).LT.LON) GO TO 10
      K=L
C...  LON IS LESS THAN LONPOS(1)
      RETURN
   10 IF(LON.LE.LONPOS(M)) GO TO 20
      K=M
C...  LON IS GREATER THAN LONPOS(MM)
      RETURN
   20 DO 40 I=1,II
      K=(L+M)/2
      IF(LONPOS(K).LT.LON) GO TO 30
      M=K
C...  LONPOS(K) IS NOT LESS THAN LON
      GO TO 40
   30 IF(LON.LE.LONPOS(K+1)) RETURN
      L=K
C...  LON IS GREATER THAN LONPOS(K+1)
   40 CONTINUE
C...  LONPOS IS NOT PROPERLY SORTED.
      STOP 999
      END
```

SECPOP Program Files
JCL and Sample Problem Input Data for SECPOP3A.FOR

```
0         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

//CBN JOB (RACSRDSST,D013),'C.B.NELSON 557-9380',TIME=(,3)                00010000
/*ROUTE PRINT HOLD                                                        00020000
//*JOBPARM FORMS=8391,BURST=Y                                             00030000
//* USE REVISED VERSION (8/21/85) OF SECPOP3 TO DETERMINE                 00040000
//* POPULATIONS FOR SITES IN CAA BID.                                     00050000
//PROCLIB DD DSN=CBNRACS.PROC.LIB,DISP=SHR                                00060000
//POP EXEC FORTVLG,PGMNAME=SECPOP3A,GREGION=400K                          00070000
//LKED.LOADLIB DD DSN=CBNRACS.LLIB,DISP=SHR                               00080000
//LKED.SYSIN DD *                                                         00090000
  INCLUDE LOADLIB(SECPOP3A)                                               00100000
  ENTRY MAIN                                                              00110000
//*GO.FT07F001 DD DSN=CBNRACS.CAA.POP,DISP=(,CATLG),                      00120000
//*            UNIT=DISK,SPACE=(TRK,(10,10),RLSE),                        00130000
//*            DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120)                       00140000
//GO.FT07F001 DD SYSOUT=*                                                 00150001
//GO.FT09F001 DD DSN=CBNRACS.POP.LIB(SQ80A),DISP=SHR                      00160001
//GO.SYSIN DD *                                                           00170000
SITE A: NEW YORK, NY          40 43 29  074 04 25999999 16.   16. 11.2500180000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00190000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00200000
      50.0      80.0                                                    00210000
SITE B: ST. LOUIS, MO         38 54 50  090 17 18999999 16.   16. 11.2500220000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00230000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00240000
      50.0      80.0                                                    00250000
SITE C: BARTOW, FL            27 53 06  082 01 30999999 16.   16. 11.2500260000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00270000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00280000
      50.0      80.0                                                    00290000
SITE D: LITTLE ROCK, AK       34 32 24  092 30 00999999 16.   16. 11.2500300000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00310000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00320000
      50.0      80.0                                                    00330000
SITE E: GRANTS, NM            35 21 28  107 50 17999999 16.   16. 11.2500340000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00350000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00360000
      50.0      80.0                                                    00370000
SITE F: 'REMOTE', MT          45 53 14  106 37 56999999 16.   16. 11.2500380000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00390000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00400000
      50.0      80.0                                                    00410000
SITE G: POCATELLO, ID         42 54 16  112 32 12999999 16.   16. 11.2500420000
      .500      .800      1.00      1.50      2.00      3.00      4.00  00430000
      5.00      8.00      10.0      15.0      20.0      30.0      40.0  00440000
      50.0      80.0                                                    00450000
                                                                        00460000
```