CALPUFF Version: 5.8 Level: 070623

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Clock time: 15:52:09
Date: 04-30-2015

Internal Coordinate Transformations by --- COORDLIB Version: 1.98 Level: 060911

Run Title:
CALPUFF Input File
Cleco, Brame Energy Center
2003 Baseline, REV A

INPUT GROUP: 1 -- General run control parameters

Option to run all periods found
in the met. file (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below
METRUN = 1 - Run all periods in met. file

Starting date: Year (IBYR) -- No default ! IBYR = 2003 !
(used only if Month (IBMO) -- No default ! IBMO = 1 !
METRUN = 0) Day (IBDY) -- No default ! IBDY = 1 !
Hour (IBHR) -- No default ! IBHR = 0 !

Base time zone (XBTZ) -- No default ! XBTZ = 0.0 !
PST = 8., MST = 7.
CST = 6., EST = 5.

Length of run (hours) (IRLG) -- No default ! IRLG = 8748 !

Number of chemical species (NSPEC)
Default: 5 ! NSPEC = 9 !

Number of chemical species
to be emitted (NSE) Default: 3 ! NSE = 7 !

Flag to stop run after
SETUP phase (ITEST) Default: 2 ! ITEST = 2 !
(Used to allow checking
of the model inputs, files, etc.)
ITEST = 1 - STOPS program after SETUP phase
ITEST = 2 - Continues with execution of program

```
                after SETUP

   Restart Configuration:

     Control flag (MRESTART)      Default: 0       ! MRESTART =  0   !

       0 = Do not read or write a restart file
       1 = Read a restart file at the beginning of
           the run
       2 = Write a restart file during run
       3 = Read a restart file at beginning of run
           and write a restart file during run

     Number of periods in Restart
     output cycle (NRESPD)        Default: 0       ! NRESPD =  0   !

       0 = File written only at last period
      >0 = File updated every NRESPD periods

   Meteorological Data Format (METFM)
                          Default: 1       ! METFM =  1   !

       METFM = 1 - CALMET binary file (CALMET.MET)
       METFM = 2 - ISC ASCII file (ISCMET.MET)
       METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
       METFM = 4 - CTDM plus tower file (PROFILE.DAT) and
                surface parameters file (SURFACE.DAT)
       METFM = 5 - AERMET tower file (PROFILE.DAT) and
                surface parameters file (SURFACE.DAT)

   Meteorological Profile Data Format (MPRFFM)
        (used only for METFM = 1, 2, 3)
                          Default: 1       ! MPRFFM =  1   !

       MPRFFM = 1 - CTDM plus tower file (PROFILE.DAT)
       MPRFFM = 2 - AERMET tower file (PROFILE.DAT)

   PG sigma-y is adjusted by the factor (AVET/PGTIME)**0.2
   Averaging Time (minutes) (AVET)
                          Default: 60.0    ! AVET = 60. !
   PG Averaging Time (minutes) (PGTIME)
                          Default: 60.0    ! PGTIME = 60. !


!END!

-------------------------------------------------
NOTICE: Starting year in control file sets the
      expected century for the simulation.  All
      YY years are converted to YYYY years in
      the range:  1953 2052
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INPUT GROUP: 2 -- Technical options

Vertical distribution used in the
near field (MGAUSS) Default: 1 ! MGAUSS = 1 !
0 = uniform
1 = Gaussian

Terrain adjustment method
(MCTADJ) Default: 3 ! MCTADJ = 3 !
0 = no adjustment
1 = ISC-type of terrain adjustment
2 = simple, CALPUFF-type of terrain
adjustment
3 = partial plume path adjustment

Subgrid-scale complex terrain
flag (MCTSG) Default: 0 ! MCTSG = 0 !
0 = not modeled
1 = modeled

Near-field puffs modeled as
elongated slugs? (MSLUG) Default: 0 ! MSLUG = 0 !
0 = no
1 = yes (slug model used)

Transitional plume rise modeled?
(MTRANS) Default: 1 ! MTRANS = 1 !
0 = no (i.e., final rise only)
1 = yes (i.e., transitional rise computed)

Stack tip downwash? (MTIP) Default: 1 ! MTIP = 1 !
0 = no (i.e., no stack tip downwash)
1 = yes (i.e., use stack tip downwash)

Method used to simulate building
downwash? (MBDW) Default: 1 ! MBDW = 1 !
1 = ISC method
2 = PRIME method

Vertical wind shear modeled above
stack top? (MSHEAR) Default: 0 ! MSHEAR = 0 !
0 = no (i.e., vertical wind shear not modeled)
1 = yes (i.e., vertical wind shear modeled)

Puff splitting allowed? (MSPLIT) Default: 0 ! MSPLIT = 0 !
0 = no (i.e., puffs not split)
1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM) Default: 1 ! MCHEM = 1 !
0 = chemical transformation not
modeled
1 = transformation rates computed
internally (MESOPUFF II scheme)

2 = user-specified transformation
rates used
3 = transformation rates computed
internally (RIVAD/ARM3 scheme)
4 = secondary organic aerosol formation
computed (MESOPUFF II scheme for OH)

Aqueous phase transformation flag (MAQCHEM)
(Used only if MCHEM = 1, or 3) Default: 0 ! MAQCHEM = 0 !
0 = aqueous phase transformation
not modeled
1 = transformation rates adjusted
for aqueous phase reactions

Wet removal modeled ? (MWET) Default: 1 ! MWET = 1 !
0 = no
1 = yes

Dry deposition modeled ? (MDRY) Default: 1 ! MDRY = 1 !
0 = no
1 = yes
(dry deposition method specified
for each species in Input Group 3)

Gravitational settling (plume tilt)
modeled ? (MTILT) Default: 0 ! MTILT = 0 !
0 = no
1 = yes
(puff center falls at the gravitational
settling velocity for 1 particle species)

Restrictions:
- MDRY = 1
- NSPEC = 1 (must be particle species as well)
- sg = 0 GEOMETRIC STANDARD DEVIATION in Group 8 is
set to zero for a single particle diameter

Method used to compute dispersion
coefficients (MDISP) Default: 3 ! MDISP = 3 !

1 = dispersion coefficients computed from measured values
of turbulence, sigma v, sigma w
2 = dispersion coefficients from internally calculated
sigma v, sigma w using micrometeorological variables
(u*, w*, L, etc.)
3 = PG dispersion coefficients for RURAL areas (computed using
the ISCST multi-segment approximation) and MP coefficients in
urban areas
4 = same as 3 except PG coefficients computed using
the MESOPUFF II eqns.
5 = CTDM sigmas used for stable and neutral conditions.
For unstable conditions, sigmas are computed as in
MDISP = 3, described above. MDISP = 5 assumes that
measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)
(Used only if MDISP = 1 or 5) Default: 3 ! MTURBVW = 3 !
  1 = use sigma-v or sigma-theta measurements
    from PROFILE.DAT to compute sigma-y
    (valid for METFM = 1, 2, 3, 4, 5)
  2 = use sigma-w measurements
    from PROFILE.DAT to compute sigma-z
    (valid for METFM = 1, 2, 3, 4, 5)
  3 = use both sigma-(v/theta) and sigma-w
    from PROFILE.DAT to compute sigma-y and sigma-z
    (valid for METFM = 1, 2, 3, 4, 5)
  4 = use sigma-theta measurements
    from PLMMET.DAT to compute sigma-y
    (valid only if METFM = 3)

Back-up method used to compute dispersion
when measured turbulence data are
missing (MDISP2) Default: 3 ! MDISP2 = 3 !
(used only if MDISP = 1 or 5)
  2 = dispersion coefficients from internally calculated
    sigma v, sigma w using micrometeorological variables
    (u*, w*, L, etc.)
  3 = PG dispersion coefficients for RURAL areas (computed using
    the ISCST multi-segment approximation) and MP coefficients in
    urban areas
  4 = same as 3 except PG coefficients computed using
    the MESOPUFF II eqns.

[DIAGNOSTIC FEATURE]
Method used for Lagrangian timescale for Sigma-y
(used only if MDISP=1,2 or MDISP2=1,2)
(MTAULY) Default: 0 ! MTAULY = 0 !
  0 = Draxler default 617.284 (s)
  1 = Computed as Lag. Length / (.75 q) -- after SCIPUFF
 10 < Direct user input (s) -- e.g., 306.9

[DIAGNOSTIC FEATURE]
Method used for Advective-Decay timescale for Turbulence
(used only if MDISP=2 or MDISP2=2)
(MTAUADV) Default: 0 ! MTAUADV = 0 !
  0 = No turbulence advection
  1 = Computed (OPTION NOT IMPLEMENTED)
 10 < Direct user input (s) -- e.g., 300

Method used to compute turbulence sigma-v &
sigma-w using micrometeorological variables
(Used only if MDISP = 2 or MDISP2 = 2)
(MCTURB) Default: 1 ! MCTURB = 1 !
  1 = Standard CALPUFF subroutines
  2 = AERMOD subroutines

PG sigma-y,z adj. for roughness? Default: 0 ! MROUGH = 0 !
(MROUGH)
  0 = no

1 = yes

Partial plume penetration of elevated inversion? Default: 1 ! MPARTL = 1 !
(MPARTL)
0 = no
1 = yes

Strength of temperature inversion provided in PROFILE.DAT extended records? Default: 0 ! MTINV = 0 !
(MTINV)
0 = no (computed from measured/default gradients)
1 = yes

PDF used for dispersion under convective conditions?
Default: 0 ! MPDF = 0 !
(MPDF)
0 = no
1 = yes

Sub-Grid TIBL module used for shore line?
Default: 0 ! MSGTIBL = 0 !
(MSGTIBL)
0 = no
1 = yes

Boundary conditions (concentration) modeled?
Default: 0 ! MBCON = 0 !
(MBCON)
0 = no
1 = yes, using formatted BCON.DAT file
2 = yes, using unformatted CONC.DAT file

Note: MBCON > 0 requires that the last species modeled be 'BCON'. Mass is placed in species BCON when generating boundary condition puffs so that clean air entering the modeling domain can be simulated in the same way as polluted air. Specify zero emission of species BCON for all regular sources.

Individual source contributions saved?
Default: 0 ! MSOURCE = 0 !
(MSOURCE)
0 = no
1 = yes

Analyses of fogging and icing impacts due to emissions from arrays of mechanically-forced cooling towers can be performed using CALPUFF in conjunction with a cooling tower emissions processor (CTEMISS) and its associated postprocessors. Hourly emissions of water vapor and temperature from each cooling tower cell are computed for the current cell configuration and ambient conditions by CTEMISS. CALPUFF models the dispersion of these emissions and provides cloud information in a specialized format for further analysis. Output to FOG.DAT is provided in either

'plume mode' or 'receptor mode' format.

Configure for FOG Model output?
Default: 0 ! MFOG = 0 !
(MFOG)
0 = no
1 = yes - report results in PLUME Mode format
2 = yes - report results in RECEPTOR Mode format

Test options specified to see if
they conform to regulatory
values? (MREG) Default: 1 ! MREG = 1 !

0 = NO checks are made
1 = Technical options must conform to USEPA
Long Range Transport (LRT) guidance
METFM 1 or 2
AVET 60. (min)
PGTIME 60. (min)
MGAUSS 1
MCTADJ 3
MTRANS 1
MTIP 1
MCHEM 1 or 3 (if modeling SOx, NOx)
MWET 1
MDRY 1
MDISP 2 or 3
MPDF 0 if MDISP=3
1 if MDISP=2
MROUGH 0
MPARTL 1
SYTDEP 550. (m)
MHFTSZ 0
SVMIN 0.5 (m/s)

!END!

INPUT GROUP: 3a, 3b -- Species list

Subgroup (3a)

The following species are modeled:

! CSPEC = SO2 ! !END!
! CSPEC = SO4 ! !END!
! CSPEC = NOX ! !END!
! CSPEC = HNO3 ! !END!
! CSPEC = NO3 ! !END!

```
! CSPEC =        PMC !       !END!
! CSPEC =        PMF !       !END!
! CSPEC =         EC !       !END!
! CSPEC =        SOA !       !END!

                                    Dry            OUTPUT GROUP
   SPECIES        MODELED        EMITTED      DEPOSITED            NUMBER
    NAME       (0=NO, 1=YES)   (0=NO, 1=YES)   (0=NO,            (0=NONE,
  (Limit: 12                        1=COMPUTED-GAS       1=1st CGRUP,
   Characters                         2=COMPUTED-PARTICLE   2=2nd CGRUP,
   in length)                       3=USER-SPECIFIED)     3= etc.)

!       SO2  =       1,           1,        1,            0  !
!       SO4  =       1,           1,        2,            0  !
!       NOX  =       1,           1,        1,            0  !
!      HNO3  =       1,           0,        1,            0  !
!       NO3  =       1,           0,        2,            0  !
!       PMC  =       1,           1,        2,            0  !
!       PMF  =       1,           1,        2,            0  !
!        EC  =       1,           1,        2,            0  !
!       SOA  =       1,           1,        2,            0  !

!END!
```

Note: The last species in (3a) must be 'BCON' when using the boundary condition option (MBCON > 0). Species BCON should typically be modeled as inert (no chem transformation or removal).

Subgroup (3b)

The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above.

INPUT GROUP: 4 -- Map Projection and Grid control parameters

Projection for all (X,Y):

Map projection
(PMAP) Default: UTM ! PMAP = LCC !

UTM : Universal Transverse Mercator
TTM : Tangential Transverse Mercator

LCC : Lambert Conformal Conic
PS : Polar Stereographic
EM : Equatorial Mercator
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin
(Used only if PMAP= TTM, LCC, or LAZA)
(FEAST) Default=0.0 ! FEAST = 0.000 !
(FNORTH) Default=0.0 ! FNORTH = 0.000 !

UTM zone (1 to 60)
(Used only if PMAP=UTM)
(IUTMZN) No Default ! IUTMZN = -999 !

Hemisphere for UTM projection?
(Used only if PMAP=UTM)
(UTMHEM) Default: N ! UTMHEM = N !
N : Northern hemisphere projection
S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin
(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
(RLAT0) No Default ! RLAT0 = 40N !
(RLON0) No Default ! RLON0 = 97W !

TTM : RLON0 identifies central (true N/S) meridian of projection
RLAT0 selected for convenience
LCC : RLON0 identifies central (true N/S) meridian of projection
RLAT0 selected for convenience
PS : RLON0 identifies central (grid N/S) meridian of projection
RLAT0 selected for convenience
EM : RLON0 identifies central meridian of projection
RLAT0 is REPLACED by 0.0N (Equator)
LAZA: RLON0 identifies longitude of tangent-point of mapping plane
RLAT0 identifies latitude of tangent-point of mapping plane

Matching parallel(s) of latitude (decimal degrees) for projection
(Used only if PMAP= LCC or PS)
(XLAT1) No Default ! XLAT1 = 33N !
(XLAT2) No Default ! XLAT2 = 45N !

LCC : Projection cone slices through Earth's surface at XLAT1 and XLAT2
PS : Projection plane slices through Earth at XLAT1
(XLAT2 is not used)

Note: Latitudes and longitudes should be positive, and include a
letter N,S,E, or W indicating north or south latitude, and
east or west longitude. For example,
35.9 N Latitude = 35.9N
118.7 E Longitude = 118.7E

Datum-region

The Datum-Region for the coordinates is identified by a character string. Many mapping products currently available use the model of the Earth known as the World Geodetic System 1984 (WGS-84). Other local models may be in use, and their selection in CALMET will make its output consistent with local mapping products. The list of Datum-Regions with official transformation parameters is provided by the National Imagery and Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)

WGS-84 WGS-84 Reference Ellipsoid and Geoid, Global coverage (WGS84)
NAS-C NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS (NAD27)
NAR-C NORTH AMERICAN 1983 GRS 80 Spheroid, MEAN FOR CONUS (NAD83)
NWS-84 NWS 6370KM Radius, Sphere
ESR-S ESRI REFERENCE 6371KM Radius, Sphere

Datum-region for output coordinates
(DATUM) Default: WGS-84 ! DATUM = WGS-G !

METEOROLOGICAL Grid:

Rectangular grid defined for projection PMAP,
with X the Easting and Y the Northing coordinate

No. X grid cells (NX) No default ! NX = 306 !
No. Y grid cells (NY) No default ! NY = 246 !
No. vertical layers (NZ) No default ! NZ = 10 !

Grid spacing (DGRIDKM) No default ! DGRIDKM = 6.0 !
Units: km

Cell face heights
(ZFACE(nz+1)) No defaults
Units: m
! ZFACE = 0.,20.,40.,80.,160.,320.,640.,1200.,2000.,3000.,4000. !

Reference Coordinates
of SOUTHWEST corner of
grid cell(1, 1):

X coordinate (XORIGKM) No default ! XORIGKM = -1008 !
Y coordinate (YORIGKM) No default ! YORIGKM = -1620 !
Units: km

COMPUTATIONAL Grid:

The computational grid is identical to or a subset of the MET. grid.
The lower left (LL) corner of the computational grid is at grid point (IBCOMP, JBCOMP) of the MET. grid. The upper right (UR) corner of the computational grid is at grid point (IECOMP, JECOMP) of the MET. grid.
The grid spacing of the computational grid is the same as the MET. grid.

X index of LL corner (IBCOMP) No default ! IBCOMP = 1 !
(1 <= IBCOMP <= NX)

Y index of LL corner (JBCOMP) No default ! JBCOMP = 1 !
(1 <= JBCOMP <= NY)

X index of UR corner (IECOMP) No default ! IECOMP = 306 !
(1 <= IECOMP <= NX)

Y index of UR corner (JECOMP) No default ! JECOMP = 246 !
(1 <= JECOMP <= NY)

SAMPLING Grid (GRIDDED RECEPTORS):

The lower left (LL) corner of the sampling grid is at grid point (IBSAMP, JBSAMP) of the MET. grid. The upper right (UR) corner of the sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.
The sampling grid must be identical to or a subset of the computational grid. It may be a nested grid inside the computational grid.
The grid spacing of the sampling grid is DGRIDKM/MESHDN.

Logical flag indicating if gridded
receptors are used (LSAMP) Default: T ! LSAMP = F !
(T=yes, F=no)

X index of LL corner (IBSAMP) No default ! IBSAMP = 1 !
(IBCOMP <= IBSAMP <= IECOMP)

Y index of LL corner (JBSAMP) No default ! JBSAMP = 1 !
(JBCOMP <= JBSAMP <= JECOMP)

X index of UR corner (IESAMP) No default ! IESAMP = 306 !
(IBCOMP <= IESAMP <= IECOMP)

Y index of UR corner (JESAMP) No default ! JESAMP = 246 !
(JBCOMP <= JESAMP <= JECOMP)

Nesting factor of the sampling
grid (MESHDN) Default: 1 ! MESHDN = 1 !
(MESHDN is an integer >= 1)

!END!

INPUT GROUP: 5 -- Output Options

FILE	DEFAULT VALUE *	VALUE THIS RUN *

```
Concentrations (ICON)          1              ! ICON =  1   !
Dry Fluxes (IDRY)             1              ! IDRY =  1   !
Wet Fluxes (IWET)              1              ! IWET =  1   !
2D Temperature (IT2D)          0              ! IT2D =  0   !
2D Density (IRHO)             0              ! IRHO =  0   !
Relative Humidity (IVIS)       1              ! IVIS =  1   !
 (relative humidity file is
  required for visibility
  analysis)
Use data compression option in output file?
(LCOMPRS)                     Default: T       ! LCOMPRS = T !

*
 0 = Do not create file, 1 = create file


 QA PLOT FILE OUTPUT OPTION:

   Create a standard series of output files (e.g.
   locations of sources, receptors, grids ...)
   suitable for plotting?
   (IQAPLOT)                  Default: 1       !  IQAPLOT =  1   !
     0 = no
     1 = yes

 DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

   Mass flux across specified boundaries
   for selected species reported hourly?
   (IMFLX)                    Default: 0       ! IMFLX =  0  !
     0 = no
     1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
            are specified in Input Group 0)

   Mass balance for each species
   reported hourly?
   (IMBAL)                    Default: 0       ! IMBAL =  0  !
     0 = no
     1 = yes (MASSBAL.DAT filename is
         specified in Input Group 0)


 LINE PRINTER OUTPUT OPTIONS:

   Print concentrations (ICPRT)   Default: 0       ! ICPRT =  1   !
   Print dry fluxes (IDPRT)       Default: 0       ! IDPRT =  0   !
   Print wet fluxes (IWPRT)       Default: 0       ! IWPRT =  0   !
   (0 = Do not print, 1 = Print)

   Concentration print interval
   (ICFRQ) in hours           Default: 1       ! ICFRQ =  1   !
   Dry flux print interval
   (IDFRQ) in hours           Default: 1       ! IDFRQ =  1   !
   Wet flux print interval
   (IWFRQ) in hours           Default: 1       ! IWFRQ =  1   !
```

Units for Line Printer Output
(IPRTU) Default: 1 ! IPRTU = 3 !

	for Concentration	for Deposition
1 =	g/m**3	g/m**2/s
2 =	mg/m**3	mg/m**2/s
3 =	ug/m**3	ug/m**2/s
4 =	ng/m**3	ng/m**2/s
5 =	Odour Units	

Messages tracking progress of run
written to the screen ?
(IMESG) Default: 2 ! IMESG = 2 !
0 = no
1 = yes (advection step, puff ID)
2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)

SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

SPECIES /GROUP	---- CONCENTRATIONS ---- PRINTED?	SAVED ON DISK?	------ DRY FLUXES ------ PRINTED?	SAVED ON DISK?	------ WET FLUXES ------ PRINTED?	SAVED ON DISK?	-- MASS FLUX -- SAVED ON DISK?
! SO2 =	0,	1,	0,	1,	0,	1,	1 !
! SO4 =	0,	1,	0,	1,	0,	1,	1 !
! NOX =	0,	1,	0,	1,	0,	1,	1 !
! HNO3 =	0,	1,	0,	1,	0,	1,	1 !
! NO3 =	0,	1,	0,	1,	0,	1,	1 !
! PMC =	0,	1,	0,	1,	0,	1,	1 !
! PMF =	0,	1,	0,	1,	0,	1,	1 !
! EC =	0,	1,	0,	1,	0,	1,	1 !
! SOA =	0,	1,	0,	1,	0,	1,	1 !

Note: Species BCON (for MBCON > 0) does not need to be saved on disk.

OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

Logical for debug output
(LDEBUG) Default: F ! LDEBUG = F !

First puff to track
(IPFDEB) Default: 1 ! IPFDEB = 1 !

Number of puffs to track
(NPFDEB) Default: 1 ! NPFDEB = 1 !

Met. period to start output
(NN1) Default: 1 ! NN1 = 1 !

Met. period to end output
(NN2) Default: 10 ! NN2 = 10 !

```
!END!

------------------------------------------------------------------------------

INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs
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---------------
Subgroup (6a)
---------------
     Number of terrain features (NHILL)      Default: 0     ! NHILL =  0   !

     Number of special complex terrain
     receptors  (NCTREC)                     Default: 0     ! NCTREC =  0   !

     Terrain and CTSG Receptor data for
     CTSG hills input in CTDM format ?
     (MHILL)                                 No Default     ! MHILL =  2   !
     1 = Hill and Receptor data created
        by CTDM processors & read from
        HILL.DAT and HILLRCT.DAT files
     2 = Hill data created by OPTHILL &
        input below in Subgroup (6b);
        Receptor data in Subgroup (6c)

     Factor to convert horizontal dimensions  Default: 1.0   ! XHILL2M = 1.0 !
     to meters (MHILL=1)

     Factor to convert vertical dimensions    Default: 1.0   ! ZHILL2M = 1.0 !
     to meters (MHILL=1)

     X-origin of CTDM system relative to      No Default     ! XCTDMKM = 0 !
     CALPUFF coordinate system, in Kilometers (MHILL=1)

     Y-origin of CTDM system relative to      No Default     ! YCTDMKM = 0 !
     CALPUFF coordinate system, in Kilometers (MHILL=1)

! END !

---------------
Subgroup (6b)
---------------

                  1 **
    HILL information


 HILL        XC       YC      THETAH  ZGRID  RELIEF    EXPO 1    EXPO 2   SCALE 1    SCALE 2
AMAX1    AMAX2
 NO.        (km)     (km)     (deg.)  (m)    (m)      (m)       (m)       (m)       (m)       (m)
----        ----     ----     ------  -----  ------   ------    ------    -------   -------   -----    -----

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Subgroup (6c)
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COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH

1

Description of Complex Terrain Variables:

XC, YC = Coordinates of center of hill
THETAH = Orientation of major axis of hill (clockwise from North)
ZGRID = Height of the 0 of the grid above mean sea level
RELIEF = Height of the crest of the hill above the grid elevation
EXPO 1 = Hill-shape exponent for the major axis
EXPO 2 = Hill-shape exponent for the major axis
SCALE 1 = Horizontal length scale along the major axis
SCALE 2 = Horizontal length scale along the minor axis
AMAX = Maximum allowed axis length for the major axis
BMAX = Maximum allowed axis length for the major axis

XRCT, YRCT = Coordinates of the complex terrain receptors
ZRCT = Height of the ground (MSL) at the complex terrain Receptor
XHH = Hill number associated with each complex terrain receptor (NOTE: MUST BE ENTERED AS A REAL NUMBER)

**

NOTE: DATA for each hill and CTSG receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases

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SPECIES NAME	DIFFUSIVITY (cm**2/s)	ALPHA STAR	REACTIVITY (s/cm)	MESOPHYLL RESISTANCE (dimensionless)	HENRY'S LAW COEFFICIENT
! SO2 =	.1509,	1000.0,	8.0,	.0,	.04 !
! NOX =	.1656,	1.0,	8.0,	5.0,	3.5 !
! HNO3 =	.1628,	1.0,	18.0,	.0,	.00000008 !

!END!

INPUT GROUP: 8 -- Size parameters for dry deposition of particles
---

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

```
     SPECIES     GEOMETRIC MASS MEAN       GEOMETRIC STANDARD
      NAME           DIAMETER                 DEVIATION
                    (microns)               (microns)
     -------     -------------------       ------------------
!        SO4 =          .48,                  2.0   !
!        NO3 =          .48,                  2.0   !
!        PMC =          6.0,                  2.0   !
!        PMF =          .48,                  2.0   !
!         EC =          .48,                  2.0   !
!        SOA =          .48,                  2.0   !

!END!
```

INPUT GROUP: 9 -- Miscellaneous dry deposition parameters

```
    Reference cuticle resistance (s/cm)
    (RCUTR)                    Default: 30    !  RCUTR = 30.0 !
    Reference ground resistance  (s/cm)
    (RGR)                      Default: 10    !    RGR = 10.0 !
    Reference pollutant reactivity
    (REACTR)                    Default: 8     ! REACTR = 8.0 !

    Number of particle-size intervals used to
    evaluate effective particle deposition velocity
    (NINT)                     Default: 9     !   NINT =  9  !

    Vegetation state in unirrigated areas
    (IVEG)                     Default: 1     !   IVEG =  1   !
      IVEG=1 for active and unstressed vegetation
      IVEG=2 for active and stressed vegetation
      IVEG=3 for inactive vegetation

!END!
```

INPUT GROUP: 10 -- Wet Deposition Parameters

Scavenging Coefficient -- Units: (sec)**(-1)

```
      Pollutant      Liquid Precip.       Frozen Precip.
      ---------      --------------       --------------
!        SO2 =        3.21E-05,            0.0E00 !
!        SO4 =        1.0E-04,             3.0E-05 !
!       HNO3 =         6.0E-05,             0.0E00 !
!        NO3 =        1.0E-04,             3.0E-05 !
!        PMC =         1.0E-04,             3.0E-05 !
!        PMF =        1.0E-04,             3.0E-05 !
!         EC =        1.0E-04,             3.0E-05 !
!        SOA =         1.0E-04,             3.0E-05 !

!END!
```

INPUT GROUP: 11 -- Chemistry Parameters

```
    Ozone data input option (MOZ)     Default: 1            ! MOZ =  1   !
    (Used only if MCHEM = 1, 3, or 4)
      0 = use a monthly background ozone value
      1 = read hourly ozone concentrations from
          the OZONE.DAT data file

    Monthly ozone concentrations
    (Used only if MCHEM = 1, 3, or 4 and
     MOZ = 0 or MOZ = 1 and all hourly O3 data missing)
    (BCKO3) in ppb                  Default: 12*80.
    !  BCKO3 = 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00, 40.00 !

    Monthly ammonia concentrations
    (Used only if MCHEM = 1, or 3)
    (BCKNH3) in ppb                 Default: 12*10.
    !  BCKNH3 = 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00, 3.00 !

    Nighttime SO2 loss rate (RNITE1)
    in percent/hour                 Default: 0.2         ! RNITE1 = .2 !

    Nighttime NOx loss rate (RNITE2)
    in percent/hour                 Default: 2.0         ! RNITE2 = 2.0 !

    Nighttime HNO3 formation rate (RNITE3)
    in percent/hour                 Default: 2.0         ! RNITE3 = 2.0 !

    H2O2 data input option (MH2O2)    Default: 1           ! MH2O2 =  1   !
    (Used only if MAQCHEM = 1)
      0 = use a monthly background H2O2 value
      1 = read hourly H2O2 concentrations from
          the H2O2.DAT data file
```

Monthly H2O2 concentrations
(Used only if MQACHEM = 1 and
MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)
(BCKH2O2) in ppb Default: 12*1.
! BCKH2O2 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !

--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option
(used only if MCHEM = 4)

The SOA module uses monthly values of:
Fine particulate concentration in ug/m^3 (BCKPMF)
Organic fraction of fine particulate (OFRAC)
VOC / NOX ratio (after reaction) (VCNX)
to characterize the air mass when computing
the formation of SOA from VOC emissions.
Typical values for several distinct air mass types are:

Month	1	2	3	4	5	6	7	8	9	10	11	12
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Clean Continental

BCKPMF	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
OFRAC	.15	.15	.20	.20	.20	.20	.20	.20	.20	.20	.20	.15
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.

Clean Marine (surface)

BCKPMF	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
OFRAC	.25	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.25
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.

Urban - low biogenic (controls present)

BCKPMF	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.
OFRAC	.20	.20	.25	.25	.25	.25	.25	.25	.20	.20	.20	.20
VCNX	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.

Urban - high biogenic (controls present)

BCKPMF	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.
OFRAC	.25	.25	.30	.30	.30	.55	.55	.55	.35	.35	.35	.25
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.

Regional Plume

BCKPMF	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
OFRAC	.20	.20	.25	.35	.25	.40	.40	.40	.30	.30	.30	.20
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.

Urban - no controls present

BCKPMF	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
OFRAC	.30	.30	.35	.35	.35	.55	.55	.55	.35	.35	.35	.30
VCNX	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

Default: Clean Continental
! BCKPMF = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !
! OFRAC = 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.15 !
! VCNX = 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00 !

```
!END!

-----------------------------------------------------------------------------

INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters
---------------

   Horizontal size of puff (m) beyond which
   time-dependent dispersion equations (Heffter)
   are used to determine sigma-y and
   sigma-z (SYTDEP)                    Default: 550.   ! SYTDEP = 5.5E02 !

   Switch for using Heffter equation for sigma z
   as above (0 = Not use Heffter; 1 = use Heffter
   (MHFTSZ)                            Default: 0      ! MHFTSZ =  0   !

   Stability class used to determine plume
   growth rates for puffs above the boundary
   layer (JSUP)                        Default: 5      ! JSUP =  5   !

   Vertical dispersion constant for stable
   conditions (k1 in Eqn. 2.7-3)  (CONK1)     Default: 0.01   ! CONK1 = .01 !

   Vertical dispersion constant for neutral/
   unstable conditions (k2 in Eqn. 2.7-4)
   (CONK2)                             Default: 0.1    ! CONK2 = .1 !

   Factor for determining Transition-point from
   Schulman-Scire to Huber-Snyder Building Downwash
   scheme (SS used for Hs < Hb + TBD * HL)
   (TBD)                               Default: 0.5    ! TBD = .5 !
     TBD < 0   ==> always use Huber-Snyder
     TBD = 1.5 ==> always use Schulman-Scire
     TBD = 0.5 ==> ISC Transition-point

   Range of land use categories for which
   urban dispersion is assumed
   (IURB1, IURB2)                      Default: 10     ! IURB1 =  10  !
                                       19     ! IURB2 =  19  !

   Site characterization parameters for single-point Met data files ---------
   (needed for METFM = 2,3,4,5)

     Land use category for modeling domain
     (ILANDUIN)                        Default: 20     ! ILANDUIN =  20  !

     Roughness length (m) for modeling domain
     (Z0IN)                            Default: 0.25   ! Z0IN = .25 !

     Leaf area index for modeling domain
     (XLAIIN)                          Default: 3.0    ! XLAIIN = 3.0 !
```

Elevation above sea level (m)
(ELEVIN) Default: 0.0 ! ELEVIN = .0 !

Latitude (degrees) for met location
(XLATIN) Default: -999. ! XLATIN = -999.0 !

Longitude (degrees) for met location
(XLONIN) Default: -999. ! XLONIN = -999.0 !

Specialized information for interpreting single-point Met data files -----

Anemometer height (m) (Used only if METFM = 2,3)
(ANEMHT) Default: 10. ! ANEMHT = 10.0 !

Form of lateral turbulance data in PROFILE.DAT file
(Used only if METFM = 4,5 or MTURBVW = 1 or 3)
(ISIGMAV) Default: 1 ! ISIGMAV = 1 !
0 = read sigma-theta
1 = read sigma-v

Choice of mixing heights (Used only if METFM = 4)
(IMIXCTDM) Default: 0 ! IMIXCTDM = 0 !
0 = read PREDICTED mixing heights
1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)
(XMXLEN) Default: 1.0 ! XMXLEN = 1.0 !

Maximum travel distance of a puff/slug (in
grid units) during one sampling step
(XSAMLEN) Default: 1.0 ! XSAMLEN = 10.0 !

Maximum Number of slugs/puffs release from
one source during one time step
(MXNEW) Default: 99 ! MXNEW = 60 !

Maximum Number of sampling steps for
one puff/slug during one time step
(MXSAM) Default: 99 ! MXSAM = 60 !

Number of iterations used when computing
the transport wind for a sampling step
that includes gradual rise (for CALMET
and PROFILE winds)
(NCOUNT) Default: 2 ! NCOUNT = 2 !

Minimum sigma y for a new puff/slug (m)
(SYMIN) Default: 1.0 ! SYMIN = 1.0 !

Minimum sigma z for a new puff/slug (m)
(SZMIN) Default: 1.0 ! SZMIN = 1.0 !

Default minimum turbulence velocities sigma-v and sigma-w
for each stability class over land and over water (m/s)
(SVMIN(12) and SWMIN(12))

```
          ---------- LAND ----------      --------- WATER ----------
  Stab Class :  A    B    C    D    E    F       A    B    C    D    E    F
          ---  ---  ---  ---  ---  ---     ---  ---  ---  ---  ---  ---
Default SVMIN : .50, .50, .50, .50, .50, .50,     .50, .50, .50, .50, .50, .50
Default SWMIN : .20, .12, .08, .06, .03, .016,    .20, .12, .08, .06, .03, .016

    ! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500!
    ! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120, 0.080, 0.060, 0.030, 0.016!

Divergence criterion for dw/dz across puff
used to initiate adjustment for horizontal
convergence (1/s)
Partial adjustment starts at CDIV(1), and
full adjustment is reached at CDIV(2)
(CDIV(2))                    Default: 0.0,0.0  ! CDIV = .0, .0 !

Minimum wind speed (m/s) allowed for
non-calm conditions. Also used as minimum
speed returned when using power-law
extrapolation toward surface
(WSCALM)                     Default: 0.5    ! WSCALM = .5 !

Maximum mixing height (m)
(XMAXZI)                     Default: 3000.  ! XMAXZI = 3000.0 !

Minimum mixing height (m)
(XMINZI)                     Default: 50.    ! XMINZI = 20.0 !

Default wind speed classes --
5 upper bounds (m/s) are entered;
the 6th class has no upper limit
(WSCAT(5))                Default   :
                     ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8 (10.8+)

                Wind Speed Class :  1     2     3     4     5
                                   ---   ---   ---   ---   ---
                     ! WSCAT = 1.54, 3.09, 5.14, 8.23, 10.80 !

Default wind speed profile power-law
exponents for stabilities 1-6
(PLX0(6))                 Default   : ISC RURAL values
                     ISC RURAL : .07, .07, .10, .15, .35, .55
                     ISC URBAN : .15, .15, .20, .25, .30, .30

                 Stability Class :  A     B     C     D     E     F
                                   ---   ---   ---   ---   ---   ---
                     ! PLX0 = 0.07, 0.07, 0.10, 0.15, 0.35, 0.55 !

Default potential temperature gradient
for stable classes E, F (degK/m)
(PTG0(2))                 Default: 0.020, 0.035
                     ! PTG0 = 0.020,   0.035 !

Default plume path coefficients for
each stability class (used when option
for partial plume height terrain adjustment
```

```
is selected -- MCTADJ=3)
(PPC(6))                Stability Class :  A     B     C     D     E     F
                      Default  PPC : .50,  .50,  .50,  .50,  .35,  .35
                                     ---   ---   ---   ---   ---   ---
                         !  PPC = 0.50, 0.50, 0.50, 0.50, 0.35, 0.35 !

Slug-to-puff transition criterion factor
equal to sigma-y/length of slug
(SL2PF)                         Default: 10.        ! SL2PF = 10.0 !

Puff-splitting control variables ------------------------

 VERTICAL SPLIT
 --------------

 Number of puffs that result every time a puff
 is split - nsplit=2 means that 1 puff splits
 into 2
 (NSPLIT)                       Default:   3        ! NSPLIT =  3  !

 Time(s) of a day when split puffs are eligible to
 be split once again; this is typically set once
 per day, around sunset before nocturnal shear develops.
 24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)
 0=do not re-split    1=eligible for re-split
 (IRESPLIT(24))                 Default:  Hour 17 = 1
 !  IRESPLIT = 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0 !


 Split is allowed only if last hour's mixing
 height (m) exceeds a minimum value
 (ZISPLIT)                      Default: 100.       ! ZISPLIT = 100.0 !

 Split is allowed only if ratio of last hour's
 mixing ht to the maximum mixing ht experienced
 by the puff is less than a maximum value (this
 postpones a split until a nocturnal layer develops)
 (ROLDMAX)                      Default: 0.25       ! ROLDMAX = 0.25 !


 HORIZONTAL SPLIT
 ----------------

 Number of puffs that result every time a puff
 is split - nsplith=5 means that 1 puff splits
 into 5
 (NSPLITH)                      Default:   5        ! NSPLITH =  5  !

 Minimum sigma-y (Grid Cells Units) of puff
 before it may be split
 (SYSPLITH)                     Default:  1.0       ! SYSPLITH = 1.0 !

 Minimum puff elongation rate (SYSPLITH/hr) due to
 wind shear, before it may be split
 (SHSPLITH)                     Default:  2.        ! SHSPLITH = 2.0 !
```

Minimum concentration (g/m^3) of each
species in puff before it may be split
Enter array of NSPEC values; if a single value is
entered, it will be used for ALL species
(CNSPLITH) Default: 1.0E-07 ! CNSPLITH = 1.0E-07 !

Integration control variables ----------

Fractional convergence criterion for numerical SLUG
sampling integration
(EPSSLUG) Default: 1.0e-04 ! EPSSLUG = 1.0E-04 !

Fractional convergence criterion for numerical AREA
source integration
(EPSAREA) Default: 1.0e-06 ! EPSAREA = 1.0E-06 !

Trajectory step-length (m) used for numerical rise
integration
(DSRISE) Default: 1.0 ! DSRISE = 1.0 !

Boundary Condition (BC) Puff control variables ----------

Minimum height (m) to which BC puffs are mixed as they are emitted
(MBCON=2 ONLY). Actual height is reset to the current mixing height
at the release point if greater than this minimum.
(HTMINBC) Default: 500. ! HTMINBC = 500.0 !

Search radius (km) about a receptor for sampling nearest BC puff.
BC puffs are typically emitted with a spacing of one grid cell
length, so the search radius should be greater than DGRIDKM.
(RSAMPBC) Default: 10. ! RSAMPBC = 10.0 !

Near-Surface depletion adjustment to concentration profile used when
sampling BC puffs?
(MDEPBC) Default: 1 ! MDEPBC = 1 !
0 = Concentration is NOT adjusted for depletion
1 = Adjust Concentration for depletion

!END!

INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters

Subgroup (13a)

Number of point sources with
parameters provided below (NPT1) No default ! NPT1 = 2 !

Units used for point source
emissions below (IPTU) Default: 1 ! IPTU = 3 !

```
        1 =       g/s
        2 =      kg/hr
        3 =      lb/hr
        4 =    tons/yr
        5 =    Odour Unit * m**3/s  (vol. flux of odour compound)
        6 =    Odour Unit * m**3/min
        7 =    metric tons/yr

    Number of source-species
    combinations with variable
    emissions scaling factors
    provided below in (13d)       (NSPT1) Default: 0  !  NSPT1 =  0  !

    Number of point sources with
    variable emission parameters
    provided in external file      (NPT2)  No default  !  NPT2 =  0  !

    (If NPT2 > 0, these point
    source emissions are read from
    the file: PTEMARB.DAT)

!END!

---------------
Subgroup (13b)
---------------
                                a
        POINT SOURCE: CONSTANT DATA
        ----------------------------
                                                          b         c
  Source      X        Y      Stack    Base     Stack    Exit  Exit    Bldg.  Emission
   No.    Coordinate Coordinate Height Elevation Diameter  Vel.  Temp.   Dwash   Rates
            (km)      (km)      (m)      (m)       (m)  (m/s) (deg. K)
  ------   ---------- ---------- ------  ------   -------- ----- -------- ----- --------
   1 ! SRCNAM = Unit 1 !
   1 ! X =   408.486,  -942.4,  59.74, 34.14,  5.151,  22.742, 414.82,      0,
         3354.3,54.9,1321.5,0,0,48.9,121.8,9.7,9.7!
   1 ! ZPLTFM = 0 !
   1 ! FMFAC = 1 !
   1 ! END !
   2 ! SRCNAM = Unit 2 !
   2 ! X =   408.412,   -942.286,  81.08, 34.16,  5.486,  36.271, 425.93,      0,
         5494.9,71.0,2924.0,0,0,56.0,43.2,1.7,17.7!
   2 ! ZPLTFM = 0 !
   2 ! FMFAC = 1 !
   2 ! END !

--------

    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.

     SRCNAM  is a 12-character name for a source
           (No default)
     X       is an array holding the source data listed by the column headings
```

(No default)

SIGYZI is an array holding the initial sigma-y and sigma-z (m)
(Default: 0.,0.)

ZPLTFM is the platform height (m) for sources influenced by an isolated structure that has a significant open area between the surface and the bulk of the structure, such as an offshore oil platform. The Base Elevation is that of the surface (ground or ocean), and the Stack Height is the release height above the Base (not above the platform). Building heights entered in Subgroup 13c must be those of the buildings on the platform, measured from the platform deck. ZPLTFM is used only with MBDW=1 (ISC downwash method) for sources with building downwash.
(Default: 0.0)

FMFAC is a vertical momentum flux factor (0. or 1.0) used to represent the effect of rain-caps or other physical configurations that reduce momentum rise associated with the actual exit velocity.
(Default: 1.0 -- full momentum used)

b

0. = No building downwash modeled
1. = Downwash modeled for buildings resting on the surface
2. = Downwash modeled for buildings raised above the surface (ZPLTFM > 0.)
NOTE: must be entered as a REAL number (i.e., with decimal point)

c

An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IPTU (e.g. 1 for g/s).

Subgroup (13c)

BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH

Source a
No. Effective building height, width, length and X/Y offset (in meters) every 10 degrees. LENGTH, XBADJ, and YBADJ are only needed for MBDW=2 (PRIME downwash option)
------ ---

---

a

Building height, width, length, and X/Y offset from the source are treated as a separate input subgroup for each source and therefore must end with an input group terminator. The X/Y offset is the position, relative to the stack, of the center of the upwind face of the projected building, with the x-axis pointing along the flow direction.

Subgroup (13d)
---

a

POINT SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 13b. Factors entered multiply the rates in 13b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---
a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters

Subgroup (14a)

Number of polygon area sources with parameters specified below (NAR1) No default ! NAR1 = 0 !

Units used for area source emissions below (IARU) Default: 1 ! IARU = 1 !

- 1 = g/m**2/s
- 2 = kg/m**2/hr
- 3 = lb/m**2/hr
- 4 = tons/m**2/yr
- 5 = Odour Unit * m/s (vol. flux/m**2 of odour compound)
- 6 = Odour Unit * m/min
- 7 = metric tons/m**2/yr

Number of source-species

combinations with variable
emissions scaling factors
provided below in (14d) (NSAR1) Default: 0 ! NSAR1 = 0 !

Number of buoyant polygon area sources
with variable location and emission
parameters (NAR2) No default ! NAR2 = 0 !
(If NAR2 > 0, ALL parameter data for
these sources are read from the file: BAEMARB.DAT)

!END!

Subgroup (14b)
---

a
AREA SOURCE: CONSTANT DATA
---

b

Source No.	Effect. Height (m)	Base Elevation (m)	Initial Sigma z (m)	Emission Rates
---	---	---	---	---

---
a
Data for each source are treated as a separate input subgroup
and therefore must end with an input group terminator.
b
An emission rate must be entered for every pollutant modeled.
Enter emission rate of zero for secondary pollutants that are
modeled, but not emitted. Units are specified by IARU
(e.g. 1 for g/m**2/s).

Subgroup (14c)

COORDINATES (km) FOR EACH VERTEX(4) OF EACH POLYGON

Source a
No. Ordered list of X followed by list of Y, grouped by source
--- ---

---
a
Data for each source are treated as a separate input subgroup
and therefore must end with an input group terminator.

Subgroup (14d)
---

a

AREA SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 14b. Factors entered multiply the rates in 14b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---
a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 15a, 15b, 15c -- Line source parameters

Subgroup (15a)

Number of buoyant line sources with variable location and emission parameters (NLN2) No default ! NLN2 = 0 !

(If NLN2 > 0, ALL parameter data for these sources are read from the file: LNEMARB.DAT)

Number of buoyant line sources (NLINES) No default ! NLINES = 0 !

Units used for line source emissions below (ILNU) Default: 1 ! ILNU = 3 !

- 1 = g/s
- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr

5 = Odour Unit * m**3/s (vol. flux of odour compound)
6 = Odour Unit * m**3/min
7 = metric tons/yr

Number of source-species
combinations with variable
emissions scaling factors
provided below in (15c) (NSLN1) Default: 0 ! NSLN1 = 0 !

Maximum number of segments used to model
each line (MXNSEG) Default: 7 ! MXNSEG = 7 !

The following variables are required only if NLINES > 0. They are
used in the buoyant line source plume rise calculations.

Number of distances at which Default: 6 ! NLRISE = 6 !
transitional rise is computed

Average building length (XL) No default ! XL = .0 !
(in meters)

Average building height (HBL) No default ! HBL = .0 !
(in meters)

Average building width (WBL) No default ! WBL = .0 !
(in meters)

Average line source width (WML) No default ! WML = .0 !
(in meters)

Average separation between buildings (DXL) No default ! DXL = .0 !
(in meters)

Average buoyancy parameter (FPRIMEL) No default ! FPRIMEL = .0 !
(in m**4/s**3)

!END!

Subgroup (15b)

BUOYANT LINE SOURCE: CONSTANT DATA

Source No.	Beg. X Coordinate (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height[a] (m)	Base Elevation (m)	Emission Rates

---

[a] Data for each source are treated as a separate input subgroup
and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by ILNTU (e.g. 1 for g/s).

Subgroup (15c)
---

a
BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 15b. Factors entered multiply the rates in 15b. Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---
a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters

Subgroup (16a)

Number of volume sources with parameters provided in 16b,c (NVL1) No default ! NVL1 = 0 !

Units used for volume source emissions below in 16b (IVLU) Default: 1 ! IVLU = 3 !

```
        1 =       g/s
        2 =      kg/hr
        3 =      lb/hr
        4 =    tons/yr
        5 =    Odour Unit * m**3/s  (vol. flux of odour compound)
        6 =    Odour Unit * m**3/min
        7 =    metric tons/yr

    Number of source-species
    combinations with variable
    emissions scaling factors
    provided below in (16c)     (NSVL1)    Default: 0  !  NSVL1 =  0  !

    Number of volume sources with
    variable location and emission
    parameters                  (NVL2)     No default  !  NVL2 =   0   !

    (If NVL2 > 0, ALL parameter data for
     these sources are read from the VOLEMARB.DAT file(s) )

!END!

---------------
Subgroup (16b)
---------------
                                a
        VOLUME SOURCE: CONSTANT DATA
        ------------------------------
                                                          b
       X          Y       Effect.    Base     Initial    Initial    Emission
    Coordinate  Coordinate   Height   Elevation  Sigma y    Sigma z     Rates
      (km)       (km)        (m)       (m)        (m)       (m)
    ----------  ----------   ------    ------    --------   --------   --------


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.

    b
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled, but not emitted.  Units are specified by IVLU
     (e.g. 1 for g/s).

---------------
Subgroup (16c)
---------------
                                        a
        VOLUME SOURCE: VARIABLE EMISSIONS DATA
        ----------------------------------------

    Use this subgroup to describe temporal variations in the emission
    rates given in 16b.  Factors entered multiply the rates in 16b.
    Skip sources here that have constant emissions.  For more elaborate
```

variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

0 = Constant
1 = Diurnal cycle (24 scaling factors: hours 1-24)
2 = Monthly cycle (12 scaling factors: months 1-12)
3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---
a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information
---

Subgroup (17a)

Number of non-gridded receptors (NREC) No default ! NREC = 120 !

!END!

Subgroup (17b)
---

a
NON-GRIDDED (DISCRETE) RECEPTOR DATA

Receptor No.	X Coordinate (km)	Y Coordinate (km)	Ground Elevation (m)	Height b Above Ground (m)	
1	!X = 270.32594,	-617.51875,	365,	0.000!	!END!
2	!X = 271.09038,	-617.49392,	365,	0.000!	!END!
3	!X = 271.85481,	-617.46902,	368,	0.000!	!END!
4	!X = 268.76735,	-616.64630,	411,	0.000!	!END!
5	!X = 269.53171,	-616.62161,	462,	0.000!	!END!
6	!X = 270.29606,	-616.59685,	431,	0.000!	!END!

```
 7 !X = 271.06042, -616.57202,     518,      0.000!  !END!
 8 !X = 271.82476, -616.54712,     487,      0.000!  !END!
 9 !X = 272.58911, -616.52215,     396,      0.000!  !END!
10 !X = 265.68053, -615.82245,     518,      0.000!  !END!
11 !X = 266.44481, -615.79804,     523,      0.000!  !END!
12 !X = 267.20909, -615.77356,     548,      0.000!  !END!
13 !X = 267.97337, -615.74902,     579,      0.000!  !END!
14 !X = 268.73764, -615.72440,     547,      0.000!  !END!
15 !X = 269.50191, -615.69971,     538,      0.000!  !END!
16 !X = 270.26618, -615.67495,     640,      0.000!  !END!
17 !X = 271.03045, -615.65013,     608,      0.000!  !END!
18 !X = 260.30172, -615.06941,     335,      0.000!  !END!
19 !X = 261.06593, -615.04550,     431,      0.000!  !END!
20 !X = 261.83014, -615.02151,     457,      0.000!  !END!
21 !X = 262.59435, -614.99746,     414,      0.000!  !END!
22 !X = 263.35855, -614.97334,     426,      0.000!  !END!
23 !X = 264.12276, -614.94914,     426,      0.000!  !END!
24 !X = 264.88696, -614.92488,     388,      0.000!  !END!
25 !X = 265.65116, -614.90054,     388,      0.000!  !END!
26 !X = 266.41536, -614.87614,     365,      0.000!  !END!
27 !X = 267.17955, -614.85167,     386,      0.000!  !END!
28 !X = 267.94374, -614.82712,     396,      0.000!  !END!
29 !X = 268.70793, -614.80251,     426,      0.000!  !END!
30 !X = 269.47212, -614.77782,     446,      0.000!  !END!
31 !X = 270.23631, -614.75307,     441,      0.000!  !END!
32 !X = 271.00049, -614.72824,     457,      0.000!  !END!
33 !X = 271.76467, -614.70335,     465,      0.000!  !END!
34 !X = 272.52885, -614.67838,     442,      0.000!  !END!
35 !X = 273.29303, -614.65335,     426,      0.000!  !END!
36 !X = 260.27294, -614.14750,     304,      0.000!  !END!
37 !X = 261.03706, -614.12359,     304,      0.000!  !END!
38 !X = 261.80119, -614.09960,     319,      0.000!  !END!
39 !X = 262.56531, -614.07555,     334,      0.000!  !END!
40 !X = 263.32944, -614.05143,     370,      0.000!  !END!
41 !X = 264.09356, -614.02724,     405,      0.000!  !END!
42 !X = 264.85767, -614.00298,     409,      0.000!  !END!
43 !X = 265.62179, -613.97865,     450,      0.000!  !END!
44 !X = 266.38590, -613.95425,     518,      0.000!  !END!
45 !X = 267.15001, -613.92978,     609,      0.000!  !END!
46 !X = 267.91412, -613.90524,     534,      0.000!  !END!
47 !X = 268.67823, -613.88062,     517,      0.000!  !END!
48 !X = 269.44233, -613.85594,     575,      0.000!  !END!
49 !X = 270.20643, -613.83119,     600,      0.000!  !END!
50 !X = 270.97053, -613.80637,     609,      0.000!  !END!
51 !X = 271.73463, -613.78148,     609,      0.000!  !END!
52 !X = 272.49872, -613.75651,     561,      0.000!  !END!
53 !X = 261.00820, -613.20168,     335,      0.000!  !END!
54 !X = 261.77224, -613.17771,     432,      0.000!  !END!
55 !X = 262.53628, -613.15366,     487,      0.000!  !END!
56 !X = 263.30032, -613.12954,     499,      0.000!  !END!
57 !X = 264.06435, -613.10535,     514,      0.000!  !END!
58 !X = 264.82839, -613.08109,     442,      0.000!  !END!
59 !X = 265.59242, -613.05676,     439,      0.000!  !END!
60 !X = 266.35645, -613.03237,     395,      0.000!  !END!
61 !X = 267.12047, -613.00790,     400,      0.000!  !END!
62 !X = 267.88449, -612.98336,     426,      0.000!  !END!
```

```
63 !X = 268.64852, -612.95875,    487,     0.000!  !END!
64 !X = 269.41254, -612.93407,    548,     0.000!  !END!
65 !X = 270.17655, -612.90932,    548,     0.000!  !END!
66 !X = 270.94057, -612.88450,    548,     0.000!  !END!
67 !X = 271.70458, -612.85962,    535,     0.000!  !END!
68 !X = 261.74329, -612.25582,    304,     0.000!  !END!
69 !X = 262.50725, -612.23177,    334,     0.000!  !END!
70 !X = 263.27120, -612.20765,    396,     0.000!  !END!
71 !X = 264.03515, -612.18347,    457,     0.000!  !END!
72 !X = 264.79910, -612.15921,    457,     0.000!  !END!
73 !X = 265.56305, -612.13489,    426,     0.000!  !END!
74 !X = 266.32699, -612.11049,    411,     0.000!  !END!
75 !X = 267.09093, -612.08603,    406,     0.000!  !END!
76 !X = 267.85487, -612.06149,    396,     0.000!  !END!
77 !X = 268.61881, -612.03689,    401,     0.000!  !END!
78 !X = 269.38274, -612.01221,    397,     0.000!  !END!
79 !X = 261.71434, -611.33393,    322,     0.000!  !END!
80 !X = 262.47821, -611.30989,    334,     0.000!  !END!
81 !X = 777.7102,  -1118.0130,    0,       0.000!  !END!
82 !X = 779.9709,  -1115.9389,    0,       0.000!  !END!
83 !X = 780.6968,  -1114.9374,    0,       0.000!  !END!
84 !X = 781.4225,  -1113.9359,    0,       0.000!  !END!
85 !X = 785.6071,  -1106.0668,    0,       0.000!  !END!
86 !X = 789.2269,  -1101.0580,    0,       0.000!  !END!
87 !X = 789.7834,  -1098.1972,    0,       0.000!  !END!
88 !X = 791.2295,  -1096.1934,    1,       0.000!  !END!
89 !X = 791.1458,  -1095.2640,    1,       0.000!  !END!
90 !X = 791.7848,  -1093.3328,    1,       0.000!  !END!
91 !X = 791.7011,  -1092.4035,    1,       0.000!  !END!
92 !X = 792.3396,  -1090.4724,    1,       0.000!  !END!
93 !X = 792.2559,  -1089.5431,    1,       0.000!  !END!
94 !X = 792.1721,  -1088.6139,    1,       0.000!  !END!
95 !X = 792.0883,  -1087.6848,    1,       0.000!  !END!
96 !X = 792.0046,  -1086.7556,    0,       0.000!  !END!
97 !X = 791.9208,  -1085.8265,    0,       0.000!  !END!
98 !X = 791.7533,  -1083.9682,    0,       0.000!  !END!
99 !X = 792.5586,  -1083.8956,    1,       0.000!  !END!
100!X = 792.4747,  -1082.9665,    1,       0.000!  !END!
101!X = 791.5858,  -1082.1101,    0,       0.000!  !END!
102!X = 792.3909,  -1082.0375,    1,       0.000!  !END!
103!X = 791.5020,  -1081.1811,    0,       0.000!  !END!
104!X = 792.3071,  -1081.1085,    1,       0.000!  !END!
105!X = 791.4182,  -1080.2521,    1,       0.000!  !END!
106!X = 791.3345,  -1079.3231,    1,       0.000!  !END!
107!X = 790.4459,  -1078.4666,    0,       0.000!  !END!
108!X = 791.2507,  -1078.3941,    1,       0.000!  !END!
109!X = 790.3623,  -1077.5376,    0,       0.000!  !END!
110!X = 791.1670,  -1077.4651,    1,       0.000!  !END!
111!X = 790.2786,  -1076.6087,    0,       0.000!  !END!
112!X = 790.1949,  -1075.6798,    0,       0.000!  !END!
113!X = 790.1113,  -1074.7509,    1,       0.000!  !END!
114!X = 789.2232,  -1073.8944,    0,       0.000!  !END!
115!X = 789.1397,  -1072.9655,    0,       0.000!  !END!
116!X = 788.2519,  -1072.1090,    0,       0.000!  !END!
117!X = 788.1684,  -1071.1802,    1,       0.000!  !END!
118!X = 787.2808,  -1070.3236,    0,       0.000!  !END!
```

```
119!X = 786.3934,  -1069.4669,     0,        0.000!   !END!
120!X = 785.5062,  -1068.6102,     0,        0.000!   !END!

 ****  CONFIRMATION OF CONTROL DATA  ****


--------------  INPUT GROUP 1  ---------------

metrun  =  0
ibyr    =  2003
ibmo    =  1
ibdy    =  1
ibhr    =  0
irlg    =  8748
xbtz    =  0.00000000E+00
nspec   =  9
nse     =  7
itest   =  2
metfm   =  1
mprffm  =  1
mrestart=  0
nrespd  =  0
avet    =  60.0000000
pgtime  =  60.0000000

--------------  INPUT GROUP 2  ---------------

mgauss =  1
mctadj =  3
mctsg  =  0
mslug  =  0
mtrans =  1
mchem  =  1
maqchem  =  0
mwet   =  1
mdry   =  1
mtilt  =  0
mdisp  =  3
mdisp2 =  3
mturbvw =  3
mtauly =  0.00000000E+00
mtauadv=  0
mcturb =  1
mrough =  0
mtip   =  1
mbdw   =  1
mshear =  0
msplit =  0
mpartl =  1
mtinv  =  0
mpdf   =  0
msgtibl=  0
mbcon  =  0
msource=  0
mfog   =  0
mreg   =  1
```

Technical options must conform to USEPA
Long Range Transport (LRT) guidance

```
METFM    1 or 2
AVET     60. (min)
PGTIME   60. (min)
MGAUSS   1
MCTADJ   3
MTRANS   1
MTIP     1
MCHEM    1 or 3 (if modeling SOx, NOx)
MWET     1
MDRY     1
MDISP    2 or 3
MPDF     0 if MDISP=3
         1 if MDISP=2
MROUGH   0
MPARTL   1
SYTDEP   550. (m)
MHFTSZ   0
SVMIN    0.5 (m/s)
```

---------- INPUT GROUP 3 ----------

```
SPECIES: SO2     j: 1  isplst(-,j) =   1  1  1  GROUP: SO2
SPECIES: SO4     j: 2  isplst(-,j) =   1  1  2  GROUP: SO4
SPECIES: NOX     j: 3  isplst(-,j) =   1  1  1  GROUP: NOX
SPECIES: HNO3    j: 4  isplst(-,j) =   1  0  1  GROUP: HNO3
SPECIES: NO3     j: 5  isplst(-,j) =   1  0  2  GROUP: NO3
SPECIES: PMC     j: 6  isplst(-,j) =   1  1  2  GROUP: PMC
SPECIES: PMF     j: 7  isplst(-,j) =   1  1  2  GROUP: PMF
SPECIES: EC      j: 8  isplst(-,j) =   1  1  2  GROUP: EC
SPECIES: SOA     j: 9  isplst(-,j) =   1  1  2  GROUP: SOA
```

---------- INPUT GROUP 4 ----------

```
pmap    = LCC
datum   = WGS-G
daten   = 02-21-2003
feast   =  0.00000000E+00
fnorth  =  0.00000000E+00
rlat0   =  40.0000000
rlon0   =  97.0000000
xlat1   =  33.0000000
xlat2   =  45.0000000
nx      =  306
ny      =  246
nz      =  10
zface  =  0.00000000E+00 20.0000000 40.0000000 80.0000000 160.000000 320.000000 640.000000
1200.00000 2000.00000 3000.00000 4000.00000
dgridkm =  6.00000000
xorigkm =  -1008.00000
yorigkm =  -1620.00000
iutmzn  =  -999
ibcomp  =  1
jbcomp  =  1
iecomp  =  306
```

```
jecomp  =  246
lsamp   =  F
ibsamp  =  1
jbsamp  =  1
iesamp  =  306
jesamp  =  246
meshdn  =  1

--------------  INPUT GROUP 5  ---------------

icon    =  1
idry    =  1
iwet    =  1
ivis    =  1
lcomprs =  T
icprt   =  1
idprt   =  0
iwprt   =  0
icfrq   =  1
idfrq   =  1
iwfrq   =  1
iprtu   =  3
imesg   =  2
imflx   =  0
imbal   =  0
iqaplot =  1
ldebug  =  F
ipfdeb  =  1
npfdeb  =  1
nn1     =  1
nn2     =  10

GROUP: SO2        j:  1  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: SO4        j:  2  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: NOX        j:  3  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: HNO3       j:  4  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: NO3        j:  5  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: PMC        j:  6  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: PMF        j:  7  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: EC         j:  8  ioutop(-,j) =  0 1 0 1 0 1 1
GROUP: SOA        j:  9  ioutop(-,j) =  0 1 0 1 0 1 1

--------------  INPUT GROUP 6  ---------------

      ------  Subgroup (6a)  ------

nhill  =  0
nctrec =  0
mhill  =  2
xhill2m=  1.00000000
zhill2m=  1.00000000
xctdmkm=  0.00000000E+00
yctdmkm=  0.00000000E+00

      ------  Subgroup (6b)  ------
```

------ Subgroup (6c) ------

---------- INPUT GROUP 7 ----------

```
SPECIES: SO2      j:  1  dryg(-,j) =     0.15   1000.00     8.00     0.00     0.04
SPECIES: SO4      j:  2  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
SPECIES: NOX      j:  3  dryg(-,j) =     0.17     1.00     8.00     5.00     3.50
SPECIES: HNO3     j:  4  dryg(-,j) =     0.16     1.00    18.00     0.00     0.00
SPECIES: NO3      j:  5  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
SPECIES: PMC      j:  6  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
SPECIES: PMF      j:  7  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
SPECIES: EC       j:  8  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
SPECIES: SOA      j:  9  dryg(-,j) =  -999.00   -999.00   -999.00   -999.00   -999.00
```

---------- INPUT GROUP 8 ----------

```
SPECIES: SO2      j:  1  dryp(-,j) =  -999.00   -999.00
SPECIES: SO4      j:  2  dryp(-,j) =     0.48     2.00
SPECIES: NOX      j:  3  dryp(-,j) =  -999.00   -999.00
SPECIES: HNO3     j:  4  dryp(-,j) =  -999.00   -999.00
SPECIES: NO3      j:  5  dryp(-,j) =     0.48     2.00
SPECIES: PMC      j:  6  dryp(-,j) =     6.00     2.00
SPECIES: PMF      j:  7  dryp(-,j) =     0.48     2.00
SPECIES: EC       j:  8  dryp(-,j) =     0.48     2.00
SPECIES: SOA      j:  9  dryp(-,j) =     0.48     2.00
```

---------- INPUT GROUP 9 ----------

```
rcutr   =  30.0000000
rgr     =  10.0000000
reactr  =  8.00000000
pconst  =  2.30000001E-08
bmin    =  1.00000001E-07
bmax    =  2.49999994E-06
qswmax  =  600.000000
dconst1 =  2.00000000
dconst2 =  0.666666687
dconst3 =  4.79999988E-04
dconst4 =  0.666666687
nint    =  9
iveg    =  1
```

---------- INPUT GROUP 10 ----------

```
SPECIES: SO2      j:  1  wa(-,j) =  3.210E-05   0.000E+00
SPECIES: SO4      j:  2  wa(-,j) =  1.000E-04   3.000E-05
SPECIES: NOX      j:  3  wa(-,j) =  0.000E+00   0.000E+00
SPECIES: HNO3     j:  4  wa(-,j) =  6.000E-05   0.000E+00
SPECIES: NO3      j:  5  wa(-,j) =  1.000E-04   3.000E-05
SPECIES: PMC      j:  6  wa(-,j) =  1.000E-04   3.000E-05
SPECIES: PMF      j:  7  wa(-,j) =  1.000E-04   3.000E-05
SPECIES: EC       j:  8  wa(-,j) =  1.000E-04   3.000E-05
SPECIES: SOA      j:  9  wa(-,j) =  1.000E-04   3.000E-05
```

---------- INPUT GROUP 11 ----------

moz = 1
bcko3m = 40.0000000 40.0000000 40.0000000 40.0000000
= 40.0000000 40.0000000 40.0000000 40.0000000
= 40.0000000 40.0000000 40.0000000 40.0000000
bcknh3m = 3.00000000 3.00000000 3.00000000 3.00000000
= 3.00000000 3.00000000 3.00000000 3.00000000
= 3.00000000 3.00000000 3.00000000 3.00000000
rnite1 = 0.200000003
rnite2 = 2.00000000
rnite3 = 2.00000000
mh2o2 = 1
bckh2o2m = 1.00000000 1.00000000 1.00000000 1.00000000
= 1.00000000 1.00000000 1.00000000 1.00000000
= 1.00000000 1.00000000 1.00000000 1.00000000
bckpmf = 1.00000000 1.00000000 1.00000000 1.00000000
= 1.00000000 1.00000000 1.00000000 1.00000000
= 1.00000000 1.00000000 1.00000000 1.00000000
ofrac = 0.150000006 0.150000006 0.200000003 0.200000003
= 0.200000003 0.200000003 0.200000003 0.200000003
= 0.200000003 0.200000003 0.200000003 0.150000006
vcnx = 50.0000000 50.0000000 50.0000000 50.0000000
= 50.0000000 50.0000000 50.0000000 50.0000000
= 50.0000000 50.0000000 50.0000000 50.0000000

---------- INPUT GROUP 12 ----------

sytdep = 550.000000
mhftsz = 0
jsup = 5
conk1 = 9.99999978E-03
conk2 = 0.100000001
iurb1 = 10
iurb2 = 19

anemht = 10.0000000
isigmav = 1
imixctdm = 0
ilanduin = 20
z0in = 0.250000000
xlaiin = 3.00000000
elevin = 0.00000000E+00
xlatin = -999.000000
xlonin = -999.000000

xmxlen = 1.00000000
mxnew = 60
xsamlen = 10.0000000
mxsam = 60
ncount = 2
sl2pf = 10.0000000
wscalm = 0.499994993
cdiv = 0.00000000E+00 0.00000000E+00

wscat = 1.53999996 top for class 1

```
wscat   =  3.08999991   top for class 2
wscat   =  5.13999987   top for class 3
wscat   =  8.22999954   top for class 4
wscat   =  10.8000002   top for class 5

Over LAND
svmin   =  0.500000000  for stability 1
svmin   =  0.500000000  for stability 2
svmin   =  0.500000000  for stability 3
svmin   =  0.500000000  for stability 4
svmin   =  0.500000000  for stability 5
svmin   =  0.500000000  for stability 6
swmin   =  0.200000003  for stability 1
swmin   =  0.119999997  for stability 2
swmin   =  7.99999982E-02  for stability 3
swmin   =  5.99999987E-02  for stability 4
swmin   =  2.99999993E-02  for stability 5
swmin   =  1.60000008E-02  for stability 6

Over WATER
svmin   =  0.500000000  for stability 1
svmin   =  0.500000000  for stability 2
svmin   =  0.500000000  for stability 3
svmin   =  0.500000000  for stability 4
svmin   =  0.500000000  for stability 5
svmin   =  0.500000000  for stability 6
swmin   =  0.200000003  for stability 1
swmin   =  0.119999997  for stability 2
swmin   =  7.99999982E-02  for stability 3
swmin   =  5.99999987E-02  for stability 4
swmin   =  2.99999993E-02  for stability 5
swmin   =  1.60000008E-02  for stability 6

symin   =  1.00000000
szmin   =  1.00000000
xminzi  =  20.0000000
xmaxzi  =  3000.00000

plx0    =  7.00000003E-02  for stability 1
plx0    =  7.00000003E-02  for stability 2
plx0    =  0.100000001  for stability 3
plx0    =  0.150000006  for stability 4
plx0    =  0.349999994  for stability 5
plx0    =  0.550000012  for stability 6

ptg0    =  1.99999996E-02  for stability 5
ptg0    =  3.50000001E-02  for stability 6

ppc     =  0.500000000  for stability 1
ppc     =  0.500000000  for stability 2
ppc     =  0.500000000  for stability 3
ppc     =  0.500000000  for stability 4
ppc     =  0.349999994  for stability 5
ppc     =  0.349999994  for stability 6
tbd     =  0.500000000
tibldist =  1.00000000 10.0000000 9.00000000
```

```
 nsplit   =  3
 iresplit =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 0
         =  0 0 0 1
         =  0 0 0 0
 zisplit  =  100.000000
 roldmax  =  0.250000000
 nsplith  =  5
 sysplith =  6000.00000
 shsplith =  3.33333325
 cnsplith =  1.00000001E-07 1.00000001E-07 1.00000001E-07 1.00000001E-07 1.00000001E-07
1.00000001E-07 1.00000001E-07 1.00000001E-07 1.00000001E-07
 epsslug  =  9.99999975E-05
 epsarea  =  9.99999997E-07
 dsrise   =  1.00000000
 trajincl =  20.0000000
 mdepbc   =  1
 htminbc  =  500.000000
 rsampbc  =  10.0000000

 --------------  INPUT GROUP 13  ---------------

 npt1     =  2
 iptu     =  3   units =   lb/hr
      converted to g/s by factor:  0.126000002
 nspt1    =  0
 npt2     =  0

 cnampt1  = UNIT 1          UNIT 2
 xpt1grd  =  236.080994 236.068665
 ypt1grd  =  112.933327 112.952332
 htstak   =  59.7400017 81.0800018
 elstak   =  34.1399994 34.1599998
 diam     =  5.15100002 5.48600006
 exitw    =  22.7420006 36.2709999
 tstak    =  414.820007 425.929993
 idownw   =  0 0
 syipt1   =  0.00000000E+00 0.00000000E+00
 szipt1   =  0.00000000E+00 0.00000000E+00
 fmfpt1   =  1.00000000 1.00000000
 zplatpt1 =  0.00000000E+00 0.00000000E+00

 pt. source: UNIT 1           number:  1
 qstak    =  422.641815 6.91740036 166.509003 0.00000000E+00 0.00000000E+00 6.16140032
15.3468008 1.22220004 1.22220004

 pt. source: UNIT 2           number:  2
 qstak    =  692.357422 8.94600010 368.424011 0.00000000E+00 0.00000000E+00 7.05600023
5.44320011 0.214200005 2.23020005

 --------------  INPUT GROUP 14  ---------------

 nar1     =  0
 iaru     =  1   units =     g/s/m^2
```

converted to g/s/m^2 by factor: 1.00000000
nsar1 = 0
nar2 = 0

---------- INPUT GROUP 15 ----------

nln2 = 0
nlines = 0
ilnu = 3 units = lb/hr
converted to g/s by factor: 0.126000002
nsln1 = 0
xl = 0.00000000E+00
hbl = 0.00000000E+00
wbl = 0.00000000E+00
wml = 0.00000000E+00
dxl = 0.00000000E+00
fprimel = 0.00000000E+00
mxnseg = 7
nlrise = 6

---------- INPUT GROUP 16 ----------

nvl1 = 0
ivlu = 3 units = lb/hr
converted to g/s by factor: 0.126000002
nsvl1 = 0
nvl2 = 0

---------- INPUT GROUP 17 ----------

nrec = 120
xng = 213.054321 213.181732 213.309128 212.794556 212.921951 213.049347 213.176743
213.304123 213.431519 212.280090 212.407471 212.534851 212.662231 212.789612 212.916992
213.044357 213.171738 211.383621 211.510986 211.638351 211.765732 211.893097 212.020462
212.147827 212.275192 212.402557 212.529922 212.657288 212.784653 212.912018 213.039383
213.166748 213.294113 213.421478 213.548843 211.378830 211.506180 211.633530 211.760880
211.888245 212.015594 212.142944 212.270294 212.397644 212.525009 212.652359 212.779709
212.907059 213.034409 213.161758 213.289108 213.416458 211.501373 211.628708 211.756042
211.883392 212.010727 212.138062 212.265396 212.392746 212.520081 212.647415 212.774750
212.902084 213.029419 213.156769 213.284103 211.623886 211.751205 211.878540 212.005859
212.133179 212.260513 212.387833 212.515152 212.642471 212.769806 212.897125 211.619049
211.746368 297.618378 297.995148 298.116119 298.237091 298.934509 299.537811 299.630554
299.871582 299.857635 299.964142 299.950195 300.056610 300.042664 300.028687 300.014709
300.000763 299.986786 299.958893 300.093109 300.079102 299.930969 300.065155 299.916992
300.051178 299.903046 299.889069 299.740997 299.875122 299.727051 299.861176 299.713104
299.699158 299.685211 299.537201 299.523285 299.375305 299.361389 299.213470 299.065552
298.917694
yng = 167.080215 167.084351 167.088501 167.225616 167.229736 167.233856 167.237991
167.242142 167.246307 167.362930 167.366989 167.371078 167.375168 167.379257 167.383377
167.387512 167.391647 167.488434 167.492416 167.496414 167.500427 167.504440 167.508469
167.512527 167.516586 167.520645 167.524719 167.528809 167.532913 167.537033 167.541153
167.545303 167.549438 167.553604 167.557785 167.642075 167.646072 167.650070 167.654068
167.658096 167.662125 167.666168 167.670227 167.674301 167.678360 167.682465 167.686569

167.690674 167.694809 167.698929 167.703079 167.707245 167.799728 167.803711 167.807724
167.811752 167.815781 167.819809 167.823868 167.827942 167.832016 167.836105 167.840210
167.844315 167.848450 167.852585 167.856735 167.957367 167.961380 167.965393 167.969421
167.973465 167.977524 167.981583 167.985657 167.989761 167.993851 167.997971 168.111008
168.115021 83.6645126 84.0101929 84.1771011 84.3440170 85.6555405 86.4903336 86.9671402
87.3011093 87.4559937 87.7778702 87.9327621 88.2546005 88.4094849 88.5643539 88.7192001
88.8740616 89.0289078 89.3386459 89.3507309 89.5055771 89.6483154 89.6604233 89.8031387
89.8152466 89.9579849 90.1128159 90.2555771 90.2676620 90.4104004 90.4224854 90.5652237
90.7200317 90.8748550 91.0176010 91.1724243 91.3151627 91.4699707 91.6127319 91.7555161
91.8982925
zng = 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
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elevng = 365.000000 365.000000 368.000000 411.000000 462.000000 431.000000 518.000000
487.000000 396.000000 518.000000 523.000000 548.000000 579.000000 547.000000 538.000000
640.000000 608.000000 335.000000 431.000000 457.000000 414.000000 426.000000 426.000000
388.000000 388.000000 365.000000 386.000000 396.000000 426.000000 446.000000 441.000000
457.000000 465.000000 442.000000 426.000000 304.000000 304.000000 319.000000 334.000000
370.000000 405.000000 409.000000 450.000000 518.000000 609.000000 534.000000 517.000000
575.000000 600.000000 609.000000 609.000000 561.000000 335.000000 432.000000 487.000000
499.000000 514.000000 442.000000 439.000000 395.000000 400.000000 426.000000 487.000000
548.000000 548.000000 548.000000 535.000000 304.000000 334.000000 396.000000 457.000000
457.000000 426.000000 411.000000 406.000000 396.000000 401.000000 397.000000 322.000000
334.000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00 0.00000000E+00
0.00000000E+00 0.00000000E+00 1.00000000 1.00000000 1.00000000 1.00000000 1.00000000
1.00000000 1.00000000 1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 1.00000000
1.00000000 0.00000000E+00 1.00000000 0.00000000E+00 1.00000000 1.00000000 1.00000000
0.00000000E+00 1.00000000 0.00000000E+00 1.00000000 0.00000000E+00 0.00000000E+00
1.00000000 0.00000000E+00 0.00000000E+00 0.00000000E+00 1.00000000 0.00000000E+00
0.00000000E+00 0.00000000E+00

INPUT FILES

```
Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.INP        1       CP_CLECO_03.INP
  CALMET.DAT        7       E:\LDEQ CALMET DATA\2003\CMET.2003.01.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.02.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.03.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.04.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.05.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.06.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.07.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.08.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.09.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.10.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.11.SOUTH.DAT
    (----)          7       E:\LDEQ CALMET DATA\2003\CMET.2003.12.SOUTH.DAT
   OZONE.DAT       22       E:\LDEQ OZONE DATA\O3_2003.TXT


-------------------------------------------------------------------------------------------------------------------------------------
        OUTPUT FILES

Default Name     Unit No.     File Name and Path
------------     --------     ------------------
 CALPUFF.LST        2       CP_CLECO_03.LST
   CONC.DAT         8       CP_CLECO_03.DAT
   DFLX.DAT         9       CP_CLECO_03.DRY
   WFLX.DAT        10       CP_CLECO_03.WET
   VISB.DAT        11       CP_CLECO_03.VIS


 LAST DAY/HOUR PROCESSED:
   Year: 2003  Month: 12   Day: 31   Julian day: 365   Hour: 11


 End of run -- Clock time: 17:21:49
                Date: 04-30-2015

      Elapsed Clock Time:     5380.0 (seconds)

              CPU Time:     5380.0 (seconds)
```