IV.D Advanced PTM flux tracking

IV.D.1 Sample dsm2.inp files for PTM Module

```
INP_FILES
# ptm specific information
ptm_runtime.inp           # runtime control
ptm_scalar.inp            # other scalar data, constants
ptm_insertion.inp         # particle insertion
ptm_flux.inp              # particle flux information
ptm_io.inp                # ptm animation and trace output files
ptm_tide.inp              # tide file information

# generic input for dsm2 configuration
translations.inp     # input name translations
type.inp             # correct for improper sign, assign types
channels.inp         # channel information
reservoirs.inp       # reservoir information
xsects.inp           # cross section information
junctions.inp        # boundary node information
list.inp             # channel numbering information
END
```

IV.D.1.a ptm_runtime.inp file

```
SCALAR
run_start_date tidefile
#run_end_date  02jan1993
#run_end_time  0500
run_length     2days
ptm_time_step  15min          #Time step for PTM
END
```

IV.D.1.b ptm_scalar.inp file

```
SCALAR
display_intvl       1hour     # how often to display run progress
ptm_ivert           t         # Use Vertical velocity profile
ptm_itrans          t         # Use Transverse velocity profile
ptm_iey             t         # Use transverse mixing
ptm_iez             t         # Use vertical mixing
ptm_fallvel         0.005     # settling velocity in ft/s
ptm_random_seed     32001     # Starting Random Number Seed
ptm_trans_constant  0.06      # Transverse Mixing Constant
ptm_vert_constant   0.0067    # Vertical Mixing Constant
END
```

IV.D.1.c ptm_insertion.inp file

The section PARTINP is only used by the PTM module. In this section, location and times of particle insertion are specified. This section has the following components:

Section keyword: PARTINP

Field keywords: NODE NPARTS SDATE STIME EDATE ETIME SLENGTH LENGTH

Note: provide either SDATE and STIME, or SLENGTH; and either EDATE and ETIME, or LENGTH

Required: yes

Overwrites: no

Description: Specifies to the PTM when and where to insert particles into the system.

Field Keyword Description:

NODE - node number to insert particles at.

NPARTS - number of particles to insert each time step.

SDATE,STIME - when to start inserting particles; 'runtime' indicates to start at model runtime (same as SLENGTH==0).

EDATE,ETIME - when to stop inserting particles.

SLENGTH - how long after start of run to start inserting particles.

LENGTH - how long an interval to insert particles (e.g. 1DAY or 23HOUR)

Example:

```
PARTINP
NODE      NPARTS    SDATE          STIME     EDATE          ETIME
330       5000      29dec1992      0100      29dec1992      0200
330       5000      runtime        none      29dec1992      0200
END

PARTINP
NODE      NPARTS    SLENGTH   LENGTH
361        5000     1hour     5day_3hour
END
```

IV.D.1.d ptm_flux.inp file

This section is only used by the PTM module. In this section the user can track particles passing specific locations or keep track of the number of particles entering defined destinations. This section has the following components:

Section keyword: PARTICLE_FLUX

Field keywords: FROM_WB TO_WB INTERVAL PERIOD MODIFIER FILENAME*

Required: no

Overwrites: no

Description: PTM Flux text and DSS output is specified in this section.

Field Keyword Description:

FROM_WB - a list of waterbody types and IDs. The waterbody types are separated by whitespace (space or tab); the IDs follow each waterbody type separated by commas. This tells the PTM to track particles passing from the specified waterbody types/IDs. IDs are either numbers (for channels and nodes), or names (for reservoirs and flow types), or accounting labels. If no waterbodies are given, then all particles passing to the TO_WB waterbodies are counted. 'All' for an ID means to count all waterbodies of that kind (e.g. all external flows). A waterbody ID preceeded with a minus sign "-" means to remove that from the list.

TO_WB - same as FROM_WB, except this tells the PTM to track particles going to the waterbodies.

Note: separate the above two fields of data with the pipe "|" character.

INTERVAL - time interval (15MIN, 1HOUR, 1DAY, etc.)

B_PART - DSS B part for flux.

MODIFIER - study name, etc. If this is the string 'runtime', a model run date-time string will be used; this allows different runs to automatically be labeled differently. If 'none', no string will be used. If this field is not used, and the environment variable DSM2MODIFIER is set, that will be used instead.

FILENAME - file to write to, if it ends in .DSS, use DSS file, otherwise text file.

Example:

```
PARTICLE_FLUX
FROM_WB          TO_WB            INTERVAL   FILENAME  b_part
chan,436,53 | chan,442,437 |  1day      flux.txt  past_Chipps
chan, 441 | stage, mtz |        1day      flux.txt  past_MTZ
res,clfct | qext,swp |          1day      flux.txt  past_SWP
```

```
chan,83,217,82 | res, clfct | 1day      flux.txt  past_72
chan, 216 | qext,cvp |        1day      flux.txt  past_CVP
 | qext,div,-nb,-ccc |       1day      flux.txt  Ag_Diversions
 | qext,div |                1day      flux.txt  All_Diversions
END
```

IV.D.1.e ptm_io.inp file

```
# I/O filenames
IO_FILES
MODEL     TYPE      IO    INTERVAL FILENAME
ptm       anim      out   15min    anim.bin     # animation file
ptm       trace     out   none     trace.bin    #contains all info
ptm       restart   out   6hours   restart.out
#ptm      restart   in    none     restart.inp
END
```

IV.D.1.f ptm_tide.inp file

Section keyword: TIDEFILE

Field keywords: START_DATE START_TIME END_DATE END_TIME FILENAME

Required: yes (for Qual and PTM)

Overwrites: no

Description: This section lets Qual and PTM know what order to use the binary output files from Hydro which contain channel flows and stages, reservoir flows, and external flows. Each time-averaged set of flows, along with its timestamp, is called a 'tide block'; a single tidefile will typically contain several of these tideblocks, along with some preliminary header information. If the tidefile was generated by a repeating tide, then the tideblocks will usually be 15 minutes or 1 hour in length, and the collection of tideblocks in a single tidefile will span exactly one tidal day (the length of a tidal day is specified in the SCALAR section, keyword TIDE_LENGTH.

Field Keyword Description:

START_DATE - starting date of tidefile. Use a date spec if desired (e.g. 05JAN1987), or use 'generic' to ignore the tidefile time stamp and simply start with the model run. Use 'runtime' or leave empty to try to find the model start runtime in the tidefile. Use 'last' or 'previous' to start right after the previous tidefile ends (not allowed on first tidefile).

START_TIME - starting time of tidefile. If 'generic' or 'last' was given for START_DATE, this can be 'none', or leave out the field, otherwise use a time spec (e.g. 1700).

END_DATE - ending date of tidefile. Use either a date spec, or a time length (e.g. 3day_5hour), or 'length' to mean use the entire

length of the tidefile. If the tidefile is repeating (if it was generated by a repeating tide run in Hydro), and 'length' is given, then the tidefile will be recycled and integer number of times.

END_TIME - ending time of tidefile; use a time spec or 'none', or leave out the field.

Example:

```
TIDEFILE
START_DATE START_TIME END_DATE END_TIME FILENAME
29dec1992      0100    length   none     hydro-unf-rpt-1h.out
END
```

IV.D.2 Sample flux.out file for PTM Module

```
/DELTA/PAST_CVP/PTM_FLUX//15MIN//
INST-CUM
PERCENT
01JAN1993 0200      0.
01JAN1993 0215      0.
.
.
.
.
06JAN1993 1845   0.500
06JAN1993 1900   0.500
06JAN1993 1915   0.500
06JAN1993 1930   0.500
06JAN1993 1945   0.500
06JAN1993 2000   0.500
06JAN1993 2015   0.500
06JAN1993 2030   0.500
06JAN1993 2045   0.500
06JAN1993 2100   0.500
.
.
.
.
/DELTA/PAST_SWP/PTM_FLUX//15MIN//
INST-CUM
PERCENT
01JAN1993 0200      0.
01JAN1993 0215      0.
01JAN1993 0230      0.
01JAN1993 0245      0.
.
.
.
```