```
**********************************************
*                                            *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)        *
*              MAY   1991                    *
*           VERSION 4.0.1E                   *
*                                            *
*  RUN DATE  04/18/94  TIME  16:01:06        *
*                                            *
**********************************************
```

```
**********************************
*                                *
*    U.S. ARMY CORPS OF ENGINEERS*
*    HYDROLOGIC ENGINEERING CENTER*
*         609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616  *
*           (916) 551-1748       *
*                                *
**********************************
```

BRADFORD SOUTH
PEAK FLOW FUTURE CONDITION
Q100 - 6HR STORM
FILE: BRAD2

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	88.	3.30	13.	13.	13.	0.03		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:06   *
*                                       *
*****************************************
```

```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X        XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID        BRADFORD SOUTH
  2       ID        PEAK FLOW FUTURE CONDITION
  3       ID        Q100 - 6HR STORM
  4       ID        FILE: BRAD2
  5       IT      2                 0     181
  6       IO      5       0

  7       KK    SB1
  8       KM        COMPUTE RUNOFF HYDROGRAPH
  9       BA   .033
 10       PH    100       0     .87    1.86     3.8     4.6     5.1     6.0
 11       LS      0    78.6
 12       UD  0.254
 13       ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:06   *
*                                       *
*****************************************
```


```
************************************
*                                  *
*    U.S. ARMY CORPS OF ENGINEERS  *
*    HYDROLOGIC ENGINEERING CENTER *
*          609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616    *
*           (916) 551-1748         *
*                                  *
************************************
```


BRADFORD SOUTH
PEAK FLOW FUTURE CONDITION
Q100 - 6HR STORM
FILE: BRAD2

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	88.	3.30	13.	13.	13.	0.03		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)    *
*             MAY  1991                 *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:06   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*         609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1         ID        BRADFORD SOUTH
    2         ID        PEAK FLOW FUTURE CONDITION
    3         ID        Q100 - 6HR STORM
    4         ID        FILE: BRAD2
    5         IT       2                0     181
    6         IO       5       0

    7         KK     SB1
    8         KM        COMPUTE RUNOFF HYDROGRAPH
    9         BA    .033
   10         PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
   11         LS       0    78.6
   12         UD   0.254
   13         ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:06   *
*                                       *
*****************************************
```


```
************************************
*                                  *
*    U.S. ARMY CORPS OF ENGINEERS  *
*    HYDROLOGIC ENGINEERING CENTER *
*          609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616    *
*           (916) 551-1748         *
*                                  *
************************************
```


BRADFORD SOUTH
PEAK FLOW FUTURE CONDITION
Q100 - 6HR STORM
FILE: BRAD2

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	2	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0600	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	88.	3.30	13.	13.	13.	0.03		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```


```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
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NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        BRADFORD SOUTH
   2          ID        PEAK FLOW PRESENT CONDITION
   3          ID        Q100 - 6HR STORM
   4          ID        FILE: BRAD1
   5          IT       2                0     181
   6          IO       5       0

   7          KK     SB1
   8          KM        COMPUTE RUNOFF HYDROGRAPH
   9          BA    0.05
  10          PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
  11          LS       0      81
  12          UD    0.69
  13          ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```


BRADFORD SOUTH
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: BRAD1

```
6 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

  IT          HYDROGRAPH TIME DATA  *
                     NMIN          2  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ         181  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME        0600  ENDING TIME
                    ICENT          19  CENTURY MARK

               COMPUTATION INTERVAL     0.03 HOURS
                   TOTAL TIME BASE     6.00 HOURS

     ENGLISH UNITS
          DRAINAGE AREA          SQUARE MILES
          PRECIPITATION DEPTH    INCHES
          LENGTH, ELEVATION      FEET
          FLOW                   CUBIC FEET PER SECOND
          STORAGE VOLUME         ACRE-FEET
          SURFACE AREA           ACRES
          TEMPERATURE            DEGREES FAHRENHEIT
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	84.	3.80	20.	20.	20.	0.05		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY  1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
************************************
*                                  *
*    U.S. ARMY CORPS OF ENGINEERS  *
*    HYDROLOGIC ENGINEERING CENTER *
*          609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616    *
*            (916) 551-1748        *
*                                  *
************************************
```


```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1         ID        BRADFORD SOUTH
    2         ID        PEAK FLOW PRESENT CONDITION
    3         ID        Q100 - 6HR STORM
    4         ID        FILE: BRAD1
    5         IT       2                0     181
    6         IO       5       0

    7         KK     SB1
    8         KM        COMPUTE RUNOFF HYDROGRAPH
    9         BA    0.05
   10         PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
   11         LS       0      81
   12         UD    0.69
   13         ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*          (916) 551-1748         *
*                                 *
***********************************
```


BRADFORD SOUTH
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: BRAD1

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	2	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0600	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	84.	3.80	20.	20.	20.	0.05		

*** NORMAL END OF HEC-1 ***

THESE CALCS WERE IN THE PLAT FILE.

4-18-94

PROPOSED ADDITION

EXISTING DA = 37.0 Ac DRAINING TO SOUTH

SOIL TYPE Fb = B

CULTIVATED W/O CONSERVATION CN = 81

$$L = \frac{2000^{.8} \; 3.75^{.7}}{1900 \sqrt{.06}} = 0.69 \text{ HR} = 42 \text{ MIN.}$$

HEC1 PEAK Q = 84 cfs 134 cfs FUTURE 37.0 Ac

AFTER DEVELOPMENT DA = 21.2 Ac 53.5% IMP.

3.3 Ac STREETS	98	323.4	
17.9 Ac ¼ Ac LOTS	75	1342.5	
21.2		1665.9	CN = 78.6

$$L = 0.49 \sqrt{\frac{0.38}{18}}^{.33} \; ^{-.57} = 0.254 \text{ HRS} = 15.3 \text{ MIN.}$$

HEC1 PEAK Q = 88 cfs

USE E-W LOT LINE TO TYLER 3.7' DROP IN 950'

PLUS TYLER SLOPE 1.5' IN 535' OR 5.2' IN 1515'

S = .0054 = 15'/MI.

```
**********************************************
*                                            *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)        *
*              MAY   1991                    *
*            VERSION 4.0.1E                  *
*                                            *
*  RUN DATE  04/18/94  TIME  16:01:33        *
*                                            *
**********************************************
```


```
**********************************
*                                *
*    U.S. ARMY CORPS OF ENGINEERS*
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET     *
*       DAVIS, CALIFORNIA 95616  *
*          (916) 551-1748        *
*                                *
**********************************
```


```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1         ID        BRADFORD SOUTH
    2         ID        PEAK FLOW FUTURE - 32.0 AC
    3         ID        Q100 - 6HR STORM
    4         ID        FILE: BRAD3
    5         IT       2                0     181
    6         IO       5       0

    7         KK     SB1
    8         KM        COMPUTE RUNOFF HYDROGRAPH
    9         BA     .05
   10         PH     100      0     .87    1.86     3.8     4.6     5.1     6.0
   11         LS       0    78.6
   12         UD   0.254
   13         ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:33   *
*                                       *
*****************************************
```


```
************************************
*                                  *
*    U.S. ARMY CORPS OF ENGINEERS  *
*    HYDROLOGIC ENGINEERING CENTER *
*          609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616    *
*           (916) 551-1748         *
*                                  *
************************************
```


BRADFORD SOUTH
PEAK FLOW FUTURE - 32.0 AC
Q100 - 6HR STORM
FILE: BRAD3

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	2	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0600	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	134.	3.30	19.	19.	19.	0.05		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```


```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        BRADFORD SOUTH
   2          ID        PEAK FLOW PRESENT CONDITION
   3          ID        Q100 - 6HR STORM
   4          ID        FILE: BRAD1
   5          IT       2                0     181
   6          IO       5       0

   7          KK     SB1
   8          KM        COMPUTE RUNOFF HYDROGRAPH
   9          BA    0.05
  10          PH     100       0      .87    1.86     3.8     4.6     5.1     6.0
  11          LS       0      81
  12          UD    0.69
  13          ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  04/18/94  TIME  15:52:41   *
*                                       *
*****************************************
```


```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*         609 SECOND STREET       *
*       DAVIS, CALIFORNIA 95616   *
*           (916) 551-1748        *
*                                 *
***********************************
```


BRADFORD SOUTH
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: BRAD1

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	84.	3.80	20.	20.	20.	0.05		

*** NORMAL END OF HEC-1 ***

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  04/18/94  TIME  16:01:06   *
*                                       *
*****************************************
```

```
***********************************
*                                 *
*    U.S. ARMY CORPS OF ENGINEERS *
*    HYDROLOGIC ENGINEERING CENTER*
*          609 SECOND STREET      *
*       DAVIS, CALIFORNIA 95616   *
*            (916) 551-1748       *
*                                 *
***********************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1         ID        BRADFORD SOUTH
    2         ID        PEAK FLOW FUTURE CONDITION
    3         ID        Q100 - 6HR STORM
    4         ID        FILE: BRAD2
    5         IT       2                0     181
    6         IO       5       0

    7         KK     SB1
    8         KM        COMPUTE RUNOFF HYDROGRAPH
    9         BA    .033
   10         PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
   11         LS       0    78.6
   12         UD   0.254
   13         ZZ
```

Worksheet 2: Time of concentration and peak discharge

Client BRADFORD NORTH By _____ Date _____

County _____ State _____ Checked _____ Date _____

Practice _____

Estimating time of concentration

1. Data:

Rainfall distribution type		=	I	(I, IA, II, III)
Drainage area	A	=	53.3	ac
Runoff curve number	CN	=	84.3	(Worksheet 1)
Watershed slope	Y	=	0.52	%
Flow length	l	=	2900	ft

2. T_c using l, Y, CN and Figure 2-7 = 1.5 hrs

or using equation 2-5

$$T_c = \frac{l^{0.8}\left(\frac{1000}{CN} - 9\right)^{0.7}}{1140\ Y^{0.5}} = \frac{(2900)^{0.8}(2.86)^{0.7}}{1140\ (.52)^{0.5}} \ldots = 1.50 \text{ hrs}$$

Estimating peak discharge

			Storm #1	Storm #2	Storm #3
1.	Frequency	yr	2	25	100
2.	Rainfall, P (24-hour)	in	3.5	6.1	7.3
3.	Initial abstraction, I_a (Use CN with table 2-4.)	in	0.375	0.375	0.375
4.	Compute I_a/P ratios		0.107	0.061	0.051
5.	Unit peak discharge, q^u (Use T_c and I_a/P with exhibit 2-_____)	cfs/ac/in	0.255	0.27	0.28
6.	Runoff, Q (Use P and CN with figure 2-6 or table 2-2)	in	1.97	4.32	5.91
7.	Peak discharge, q_p (Where $q_p = q_u A Q$)	cfs	26.78	62.17	88.05

56.3 185.39 193.13

*U.S. GOVERNMENT PRINTING OFFICE:1989-241-851:00254/SCS

Peak Discharge: Using P_{100} - 6hr Storm AMC III

CN = 84

Drainage Area = 53.3 Acres = 0.08328 mi^2

Soil complex # = 84 AMC II = 93 AMC III

L = 2900 Rainfall = 5.90 inches

H = 15 Run-off = 3.07

t_c = 0.45

84 4.10

93 5.07

Peak Discharge = 347.5 (0.08328) 4.10 = 118.65 for CN = 84

Peak Discharge = 347.5 (.08328) 5.07 = 146.72 cfs CN = 93

USE 150 cfs

(1) $\frac{5.07 \times 0.08328 \times 640}{12}$ = 22.518912 Acre-ft [illegible]

(2) $\frac{22.518912}{1196.50}$ = 0.018820654 Acre-ft = value of 1 sq in [illegible]

(3) $\frac{150}{60}$ = 2.5 cfs = value of 1 inch of flow

(4) $\frac{0.018820654 \times 12}{2.5}$ = 0.090339137 hrs = Value of 1 inch of time