

Following are the assumptions used to develop the curves for Figures 2-12 thru 2-23.

Lag Time Parameters:

$$L = 1.75x\sqrt{2x\sqrt{Ax43560}} \quad A \text{ in acres, } L \text{ in feet}$$

$$L_c = 0.5xL$$

	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
Slope (ft/ft) =	0.0005	0.0010	0.0100
Elevation (ft) =	10	50	300

Sub-basin “n”/%Impervious/infiltration Parameters:

<u>Landuse Description</u>	<u>Channelization</u>	<u>Soil Type</u>	<u>%Impervious</u>	<u>infiltration (in/hr)</u>	<u>Sub-basin “n” 10-year</u>	<u>Sub-basin “n” 100-year</u>
Highways,Parking	Developed	D	95	.04	.030	.039
Apartments,HDR	Developed	D	80	.05	.033	.043
Res. 6-8 du/ac,LDR,School	Developed	D	50	.07	.040	.052
Res. 1-2 du/ac	Developed	D	20	.07	.053	.069
Open Space,Woodland,Natural	Undeveloped	D	1	.08	.120	.120

Following are the assumptions used to develop the curves for Figure 2-24.

Zone 2

Elevation = 50 feet

50% Impervious

Soil Type D

infiltration = .07 in/hr

SACRAMENTO CITY AND COUNTY HEC-1 AND LAG TIME PROCESSORS

SETUP AND OPERATION INSTRUCTIONS

The following files are provided to set up and operate the processors:

- 1) HPRES.EXE - Preprocessor program.
- 2) DISPLAY.COM - Utility to display screens.
- 3) MARK.COM - Utility to mark memory.
- 4) RELEASE.COM - Utility to release memory to last mark.
- 5) H1PRE.LBR - Library of screens.
- 6) HPRE.BAT - Batch file to run program.
- 7) SACPRES.DOC - SACPRES setup and operation instructions.
- 8) CVTINT.EXE - Utility to make old intermediate files compatible with this version of SACPRES.

NOTE: THE OCTOBER 1, 1994 AND SUBSEQUENT VERSIONS OF THIS PROGRAM ARE NOT COMPATIBLE WITH INTERMEDIATE FILES CREATED USING PREVIOUS VERSIONS OF THIS PROGRAM. Use CVTINT utility to convert files and check results.

This program was initially written on an IBM compatible 386DX computer and has been tested on IBM compatible 286, 386, 486 and Pentium computers. The following are minimum system requirements for running this program:

- 1) System unit - IBM PC-AT or compatible using a 80286 processor.
- 2) Monitor - CGA monochrome to multisync configured as VGA.
- 3) Hard disk - Any
- 4) Operating System - Microsoft DOS 3.1 or later.

This program may work on computers containing 8086 or 80186 processors however has not been tested on these models. This program will make use of an Intel or Cyrex coprocessor if present however a coprocessor is not required for operation. Although use of this program on a computer configured with an ANSI video driver will produce undesirable screen graphics the program will still run successfully.

The following procedure is recommended for installing this program:

- 1) Make a subdirectory in the root drive (usually C:) named "SACPRES". If you are updating a previous version of this program, delete all copies of the files "HPRES.EXE" and "H1PRE.LBR" prior to installation.
- 2) Copy all files from the source disk into the SACPRES subdirectory.
- 3) Include the SACPRES directory along with directories containing HEC-1 and your editor(s) in a path.

An example Path command for a system containing the COED editor in an area named "COEDIT" and HEC-1 in an area named "HEC1" (both in the C drive) would be:

```
PATH C:\sacpre; C:\coedit; C:\hec1
```

WARNING: entry of a Path command will override any previous Path command. If a Path command already exists in your autoexec.bat file, add the arguments for Sacpre, Hec1, and your editor to this Path command and reboot. See your Microsoft DOS Manual for additional information on the Path command. Once the Path command is entered, the system menu (if supported) and program may be invoked from any area in the system.

- 4) For running in the Microsoft Windows 95 operating environment, placing the following line in the CONFIG.SYS file will disable Windows 95 text display optimization and allow SACPRES to run.

```
Switches=/C
```

If there is already a line starting with "Switches=", add "/C" to the end (without quotation marks).

To invoke the preprocessor program in interactive mode, change to the SACPRES program directory and enter "HPRES". The program will be invoked and will prompt the user for data.

To run the program in batch mode, enter:

```
HPRES 'INT Filename'<,'DAT Filename','S1','S2','S3',Rec,Dur,Area,System>
```

Where:

'INT Filename' is the name of the previously prepared intermediate file containing the basin data. The file name MUST be placed between apostrophes. The extension (.int) need not be included.

'DAT Filename' is the name for the HEC-1 input file. The file name MUST be placed between apostrophes. If no name is entered the HEC-1 input file will have the same name as the intermediate file but with the extension ".DAT".

'S1' is a switch for producing a summary print file with the extension ".prn". Valid entries for this switch are 'Y' and 'N'. Entry of 'Y' will direct the program to produce the summary output file and entry of 'N' will direct the program not to produce this file. This switch variable MUST be placed between apostrophes.

'S2' is a switch for updating program variables based on storm recurrence. Valid entries for this switch are 'Y' and 'N'. Entry of 'Y' will direct the program to update program variables which are defined internally based on recurrence. Entry of 'N' will prevent the program from updating these variables. This switch variable MUST be placed between apostrophes.

'S3' is a switch for updating program variables based on storm duration. Valid entries for this switch are 'Y' and 'N'. Entry of 'Y' will direct the program to update program variables which are defined internally based on storm duration. Entry of 'N' will prevent the program from updating these variables. This switch variable MUST

be placed between apostrophes.

"Rec" is the storm recurrence for the present run. Valid entries are 2, 5, 10, 25, 50, 100, 200 or 500 (years). No characters or decimal point are allowed in this variable field. If entered, this recurrence interval will override the recurrence interval defined in the intermediate file.

"Dur" is the storm duration for the present run. Valid entries are 6, 12, 24, 36 (hours), 5 or 10 (days). No characters or decimal point are allowed in this variable field. If entered, this storm duration will override the storm duration defined in the intermediate file.

"Area" is the total study area for the present run. Valid entries include all positive real numbers up to 9999.9999. The units of area must match the units defined in the intermediate file. No characters are allowed in this variable field. If entered, this area will override the area defined in the intermediate file.

"System" is the system of units desired for the HEC-1 data file. Valid entries include 'E' for the English system of units or 'S' or 'M' for the System International (Metric) system of units.

Entry of variables after the filename are optional. All variables must be separated by commas. Valid and invalid examples of invoking the preprocessor program in batch mode are shown below. Defaults for the switches if not entered are: S1 (summary file), N (no); S2 (recurrence update), Y (yes); S3 (duration update), Y (yes); System (system of units), E (English). The preprocessor program will use the values defined in the intermediate file for the other variables if not entered.

Valid Examples:

```
-----  
HPRES 'TEST','OUT','Y','Y','Y',100,12,3.54,'E'  
HPRES 'TEST.INT',,,,,200,'S'  
HPRES 'TEST'  
HPRES 'TEST',,,,'N',,,,,,  
HPRES 'TEST',,,,,,,209.32,
```

Invalid Examples:

```
-----  
HPRES TEST,OUT,Y,Y,Y,100,12,3.54,E  
HPRES 'TEST',,,,,200.,  
HPRES 'TEST',,,N,,,,,  
HPRES 'TEST',209.32
```

SDP PROGRAM INSTRUCTIONS

The SDP (Sacramento Design Precipitation) program has been prepared to facilitate rainfall-runoff models in Sacramento County using elliptical storm centering. This option is especially useful for model calibration and evaluation of cloudburst events. Elliptical storm centering is also useful for basin master planning.

This program is written to operate essentially as a postprocessor to the SACPRE program. After preparation of a SACPRE intermediate file (".INT" file), elliptical storm centering may be included by invoking SDP and entering additional data. The SDP program will first ask for the name of a SACPRE intermediate file with which to add elliptical storm centering data and create an "SDP" file. Additional data required for elliptical storm centering may then be entered from the keyboard. These data include coordinates of the subbasin centroid and the time of peak precipitation in the subbasin and are prompted from the user for each subbasin identified in the SACPRE intermediate file. After entry of these data the program creates the SDP file. This file is structured similar to the SACPRE intermediate file however also includes the subbasin elliptical storm centering data. Editing instructions for the SDP file are described below.

HEC-1 data files and data reference files with the extension ".PRN" are prepared by processing SDP files using the SDP program. Upon selecting the "process SDP file" option, the user will be prompted for storm data including the location of the storm center, angle of storm alignment and aspect ratio of storm. These data will be used along with the data contained in the SDP file to develop the HEC-1 data file. Entering the storm data at the time of processing allows the user to run several storm centering alternatives for a basin without having to edit the SDP file.

The PRN file created by the SDP program (if selected) contains all of the elliptical storm centering data entered for the storm and the subbasins. Additionally, total precipitation for each subbasin is included in the PRN file. For the convenience of the user, the storm data is also included near the beginning of the HEC-1 data file as a HEC-1 comment record.

INSTRUCTIONS FOR EDITING "SDP" FILE

General:

The SDP file generated by the Sacramento Design Precipitation program and identified by the filename extension of ".SDP" allows the program user to change global and other parameters used by the program to generate precipitation and hydrograph data. The SDP file is a SACPRE intermediate file modified to include storm centering data. Records used by the SDP program to recalculate the precipitation for storm centering are described below. All other records are described in the "Instructions for Editing Intermediate File" provided with SACPRE. Although the SDP program is written to accept certain strings of characters in either lower or upper case, HEC-1

does not recognize lower case characters. All record identifiers and information which is passed through to the HEC-1 data file must be in upper case characters.

"*C" Record:

This record defines the subbasin related storm centering variables. These consist of the subbasin centroid coordinates and time of peak precipitation expressed as a percentage of storm length. This record is required for all subbasins of a model using the elliptical storm centering option. This record must appear immediately after the "*S" record identifying the subbasin.

Variable	Column(s)	Format	Acceptable values
Identification	1,2	alpha	"*C" only
Centroid X-coordinate	3-12	integer	any integer, feet
Centroid Y-coordinate	13-22	integer	any integer, feet
Time of Peak	37-40	real	0.0 to 99.9, percent

All other information produced on this record by the HEC-1 preprocessor is provided for the sole purpose of making this record easier to understand. The value for lag will be ignored if "*LC" or "*LN" records are used to recalculate lag for the subbasin.