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Author

Miller, J.J., D. L. Gustafson, S. E. Rawlinson/RSN

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Flood Assessment at the Proposed Area 6 Liquid Waste Treatment System

DOE/Nevada Test Site, Nye County, Nevada

Prepared by Raytheon Services Nevada
Environmental Restoration and
Waste Management Division

For the U.S. Department of Energy
Nevada Operations Office

Office of Assistant Manager for
Environmental Restoration and
Waste Management

Under Raytheon Services Nevada
Contract DE-AC08-91NV10833

EXECUTIVE SUMMARY

A flood assessment was conducted at the proposed Liquid Waste Treatment System (LWTS) in Area 6 of the Nevada Test Site (NTS) in Nye County, Nevada. This facility was designed to the specifications noted in Department of Energy (DOE) Order 6430.1A, *General Design Criteria*, with modifications to the flood requirements. DOE Order 6430.1A states that the 25- and 100-year flood hazards be evaluated, and for a "critical action" facility, the 500-year flood hazard also be evaluated. However, because the proposed LWTS may be classified as a *Non-Reactor Nuclear Facility, Category 3*, DOE Order 6430.1A specifically requires that the flood hazard for the facility be evaluated using the Probable Maximum Flood (PMF). Department of Energy/Nevada (DOE/NV) has determined that using the PMF as the design storm for facilities and flood control structures on the NTS is unrealistic and not economically feasible. Design of flood control structures is practical to keep a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3*, from being inundated by waters of the 500-year flood. This modification to the flood requirements has been communicated by DOE/NV to Department of Energy/ Headquarters (DOE/HQ).

The site of the proposed Area 6 LWTS, approximately one mile north of the Area 6 Control Point (CP) near News Nob, is adjacent to the southwestern edge of Yucca Lake, a playa lake located at the topographic low of Yucca Flat basin. The watershed area for Yucca Flat is approximately 300-square miles, encompassing parts of the NTS and parts of the Nellis Air Force Range to the north and east of NTS in both Nye and Lincoln counties. Only the subbasins (LWTS subbasins) to the west of the site and associated alluvial fans directly impact the proposed LWTS. The Yucca Flat drainage basin was delineated using 7.5- and 30x60-minute United States Geological Survey (USGS) topographic quadrangle maps of the area. The LWTS subbasins were delineated using the Yucca Lake (1986) 7.5-minute USGS topographic quadrangle map. Basin delineations were verified by study of color aerial photos, and for the LWTS subbasins, by field observations.

The objective of this flood assessment was to determine the 25-year, 24-hour; 100-year, 6-hour; and 500-year, 6-hour flood hazards on and near the proposed Area 6 LWTS using the most site-specific and applicable approaches for the hydrologic and hydraulic analyses. Because of the similar physical setting and close proximity of the site to Clark County, the methods described in the Clark County Regional Flood Control District Manual (1990) were considered the best approach for the flood assessment of the proposed Area 6 LWTS.

Three flood hazard concerns were addressed in this flood assessment: potential flooding of the proposed Area 6 LWTS caused by alluvial fans, sheetflow and/or the rising water surface elevation of Yucca Lake. For alluvial fans and sheetflow flood hazard determinations, the 2-, 10-, 25-, and 100-year, 6-hour discharges for the LWTS subbasins were generated by the HEC-1 computer program developed by the U.S. Army Corps of Engineers (COE, 1990a) and verified by a comparison of skew coefficients generated by the Federal Emergency Management Agency (FEMA) FAN (FEMA FAN) model (1990).

The 500-year, 6-hour discharge was then extrapolated by the FEMA FAN model (1990) from the model-produced flood frequency curve. The 25-year, 24-hour discharge for the LWTS subbasins was also generated by the HEC-1 computer program (COE, 1990a), but was not verified by the FEMA FAN model (1990).

The 100-year flood hazard for the CP-North and News Nob alluvial fans was analyzed using the FEMA FAN model (1990). This program was used to delineate the flood hazard zones on these alluvial fans in accordance with FEMA methods. The FEMA FAN model (1990) requires information regarding apex location, fan boundaries, potential flow obstructions and diversions, fan surface slopes, Manning roughness coefficients, single-channel versus multiple-channel regions, and the 2-, 10-, 25-, and 100-year, 6-hour discharges from the hydrologic analysis. This information was gathered from studies of available topographic and surficial geologic maps and intensive field investigations. The proposed Area 6 LWTS is not the 100-year flood hazard zone of either the CP-North or News Nob alluvial fans. The results of the alluvial fan analyses are shown on the maps included in this document.

FEMA has developed methods to determine the 100-year flood hazards from sheetflow. These same methods were used to determine the 25-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour flood hazards from sheetflow. Calculated 100-year depths within the proposed LWTS vicinity were all less than 1 foot; therefore this facility is not in a FEMA designated 100–year flood hazard from flow draining from the CP Hills. The calculated 25-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour depths were also less than 1 foot; therefore, the facility is not in a 25-year, 6-hour; 25-year, 24-hour; or 500-year, 6-hour flood hazard zone from sheetflow.

To determine the flood hazard of the rising water surface elevation of Yucca Lake, calculated rainfall values necessary to fill the lake to specified elevations were compared with rainfall values used in the 25-year, 6-hour; 25-year, 24-hour; and 100-year, 6-hour

The 25-year, 6-hour rainfall event would not produce enough runoff to create a lake water surface elevation higher than approximately 3925 ft-msl (5 feet above datum). The 100-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour rainfall events would produce enough runoff to create a water surface elevation between 3925 ft-msl and 3930 ft-msl (between 5 and 10 feet above datum). In accordance with DOE/NV modifications to DOE Order 6430.1A, the Area 6 proposed LWTS must be located at approximately 3930 ft-msl or higher to be outside of the 500-year, 6-hour flood hazard.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

1.1 Location 1
1.2 Purpose 1
1.3 Objective 3

2.0 WATERSHED DESCRIPTION 3

2.1 Introduction 3
2.2 Apex Definitions 3
2.3 CP-North Alluvial Fan 6
2.4 News Nob Alluvial Fan 6

3.0 HYDROLOGY: LWTS SUBBASINS 8

3.1 Methods 8

3.1.1 Precipitation 9

a. Point Precipitation Values 9
b. Storm Duration and Time Distribution 10
c. Depth–Area Ratios 10

3.1.2 Drainage Areas 14
3.1.3 Precipitation Losses 15
3.1.4 Lag Time 17
3.1.5 Channel Routing 19

3.2 Hydrologic Models 19

3.2.1 Model Layout 20
3.2.2 Concentration Points 20

3.3 Hydrology Results 20
3.4 Hydrology Discussion 20

4.0 HYDROLOGY: YUCCA LAKE 27

5.0 HYDRAULICS AND FLOOD HAZARD DETERMINATION 28

5.1.2 Sheetflow 33
5.1.3 Yucca Lake 33

TABLE OF CONTENTS

5.2 Results and Discussion of Flood Hazard Determination 34

5.2.1 Alluvial Fan Flooding 34
5.2.2 Sheetflow 34
5.2.3 Yucca Lake 35

6.0 REFERENCES 36

Appendix A DOE/NV Letter to DOE/HQ A1
Appendix B Calculations of Hydrologic Parameters. B1
Appendix C HEC-1 Model Output C1
Appendix D Skew Coefficient Analyses Using FEMA FAN Model D1
Appendix E Flood Hazards from FEMA FAN Model Output E1
Appendix F Yucca Lake Water Volume Calculations F1
Appendix G 500-Year, 6-Hour Rainfall Estimate G1
Appendix H Sheetflow Depth Calculations H1

LIST OF TABLES

Table 1. Six-Hour Storm Point Precipitation Values and Correction Factors . . 9
Table 2. Six–Hour Precipitation Depth–Area Reduction Factors 14
Table 3. Runoff Curve Numbers 15
Table 4. Subbasin Curve Numbers. 17
Table 5. Lag Equation Roughness Factors 18
Table 6. Lag Time Parameters. 18
Table 7. Routing parameters used in the Muskingum routing method. 19
Table 8. Hydrologic Models 21
Table 9. HEC-1 model-generated discharges at key locations. 23
Table 10. Skew Coefficients From Different Model Sets (6-hour storms) 25
Table 11. Calculated Yucca Lake water volumes. 28
Table 12. Calculated rainfall values. 35

LIST OF FIGURES

Figure 1. Location Map and Physiographic Features of the Nevada Test Site and the Area 6 Proposed Liquid Waste Treatment Site 2
Figure 2. Watershed Map of LWTS Subbasins. 4
Figure 3. Idealized Alluvial Fan Profile. 5
Figure 4. Flood Hazard Map. 7
Figure 5. Intensity Duration Relationships for Various Return Periods, Cane Springs, Nevada Test Site, Nevada 11
Figure 6. Hypothesized Zones of Precipitation in Southern Nevada 12
Figure 7. Storm Distributions 13
Figure 8. Schematic Diagram of Subbasin Network. 22
Figure 9. Generalized U.S. Skew Coefficients. 24
Figure 10. . . Alluvial Fan Plan View. 31

1.0 INTRODUCTION

1.1 Location

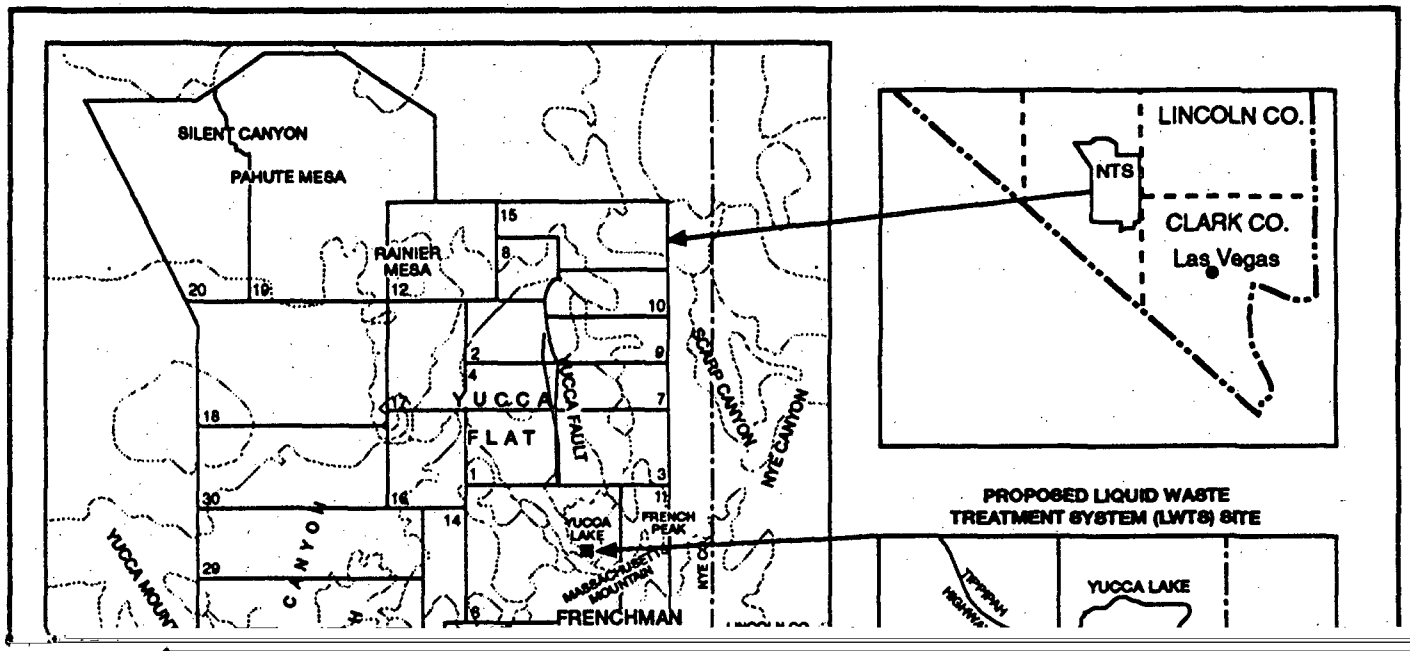
A flood assessment was conducted at the proposed Liquid Waste Treatment System (LWTS) in Area 6 of the Nevada Test Site (NTS) in Nye County, Nevada (Figure 1). The study area encompasses the approximately 300-square mile Yucca Flat watershed, but focuses on a 1.7-square mile drainage basin near News Nob, approximately one mile north of the Area 6 Control Point (CP). The site of the proposed Area 6 LWTS, within this 1.7-square mile drainage basin, is located on an alluvial fan bounded by Mercury Highway to the west and the southwestern edge of Yucca Lake to the east.

1.2 Purpose

Flood assessment is one of the risk analysis categories for the proposed LWTS. The principal federal and state regulations and criteria pertaining to flooding to which the proposed LWTS must comply are:

- 40 CFR 270.14 (*General Requirements for a Hazardous Waste Facility*),
- Executive Order 11988 (*Floodplain Management*),
- 40 CFR 264.18 (*Location Standards for Hazardous Waste Management Facility*),
- Department of Energy (DOE) Order 6430.1A, *General Design Criteria*,
- DOE/NVO-341, *Environmental Compliance Handbook* (September 1990)
- Nevada Administrative Code 444.8456 (*Restrictions on Locations of Stationary Facilities for Management of Hazardous Waste; Exceptions*)

This facility was designed to the specifications noted in Department of Energy (DOE) Order 6430.1A, *General Design Criteria*, with modifications to the flood requirements. DOE Order 6430.1A states that the 25- and 100-year flood hazards be evaluated, and for a "critical action" facility, the 500-year flood hazard also be evaluated. However, because the proposed LWTS may be classified as a *Non-Reactor Nuclear Facility, Category 3*, DOE Order 6430.1A specifically requires that the flood hazard for the facility be evaluated using the Probable Maximum Flood (PMF). Department of Energy/Nevada (DOE/NV) has determined that using the PMF as the design storm for facilities and flood control structures on the NTS is unrealistic and not economically feasible. Design of flood control structures is practical to keep a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3*, from being inundated by waters of the 500-year flood. This modification to the flood requirements has been communicated by DOE/NV to Department of Energy/ Headquarters (DOE/HQ) (Appendix A).


SILENT CANYON
PAHUTE MESA
RAINIER MESA
YUCCA FLAT
YUCCA FAULT
SCARP CANYON
NYE CANYON
YUCCA MOUNT
YUCCA LAKE
FRENCH PEAK
MASSACHUSETTS MOUNTAIN
FRENCHMAN
LINCOLN CO.
NTS
CLARK CO.
Las Vegas
PROPOSED LIQUID WASTE TREATMENT SYSTEM (LWTS) SITE
YUCCA LAKE

1.3 Objective

The objective of this flood assessment was to meet requirements of both Resource Conservation and Recovery Act (RCRA) and DOE regulations by determining the 25-year, 24-hour; 100-year, 6-hour; and 500-year, 6-hour flood hazards on and near the proposed Area 6 LWTS using the most site-specific and applicable approaches for the hydrologic and hydraulic analyses. Three flood hazard concerns were addressed in this flood assessment: potential flooding of the proposed Area 6 LWTS caused by alluvial fan flooding, sheetflow and/or the rising water surface elevation of Yucca Lake. This flood assessment was conducted following criteria for flood hazard determination required by the Federal Emergency Management Agency (FEMA) to provide hydrologic and hydraulic information for design of flood protection structures for the facility.

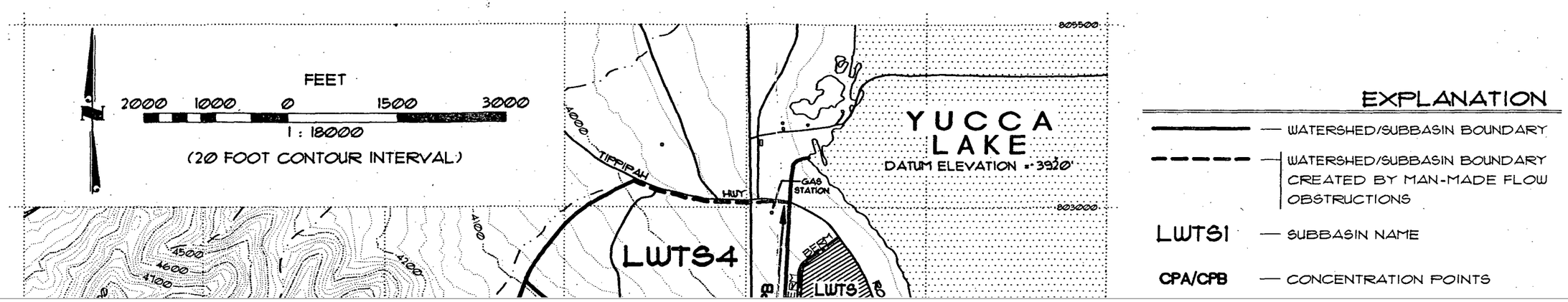
2.0 WATERSHED DESCRIPTION

2.1 Introduction

The watershed area for Yucca Flat is approximately 300-square miles, encompassing parts of the NTS and parts of the Nellis Air Force Range to the north and east of NTS in both Nye and Lincoln counties. The 1.7-square mile drainage basin that could directly impact the proposed Area 6 LWTS was subdivided into five subbasins (Figure 2). These subbasins represent the drainage areas for Control Point-North (CP-North) and News Nob alluvial fans. Two concentration points for the flow from the five delineated subbasins were chosen to best represent the hydrology of the study area. The apex of News Nob Alluvial Fan represents one of these concentration points. The other concentration point is the northwestern edge of the News Nob Alluvial Fan (*Figure 2*). Concentration point locations were based on aerial photographs, topographic data, and field observations.

2.2 Apex Definitions

In this study, both a geologic definition and a FEMA definition for the apex of an alluvial fan are described. The geologic apex of an alluvial fan is the intersection of the mountain front and the piedmont plain (Figure 3). On many alluvial fans, a channel is entrenched into the upper, and possibly the middle part of the fan (Bull, 1964). Fans with entrenched channels have the active apex farther down the fan. FEMA defines the apex as the point below which the flowpath of the major stream that formed the fan becomes unpredictable and flooding of the fan can occur (FEMA, 1991). The FEMA definition was used in this study to determine the active apexes of the two alluvial fans within the study area: CP-North and News Nob alluvial fans (*Figure 2*).


FEET
2000 1000 0 1500 3000
1 : 18000
(20 FOOT CONTOUR INTERVAL)
YUCCA
LAKE
DATUM ELEVATION = 3920'
TIPPIPAH
HWY
GAS STATION
LWTS4
LWTS
4000
4100
4500
4600
4700
EXPLANATION
— WATERSHED/SUBBASIN BOUNDARY
— WATERSHED/SUBBASIN BOUNDARY CREATED BY MAN-MADE FLOW OBSTRUCTIONS
LWTS1 — SUBBASIN NAME
CPA/CPB — CONCENTRATION POINTS

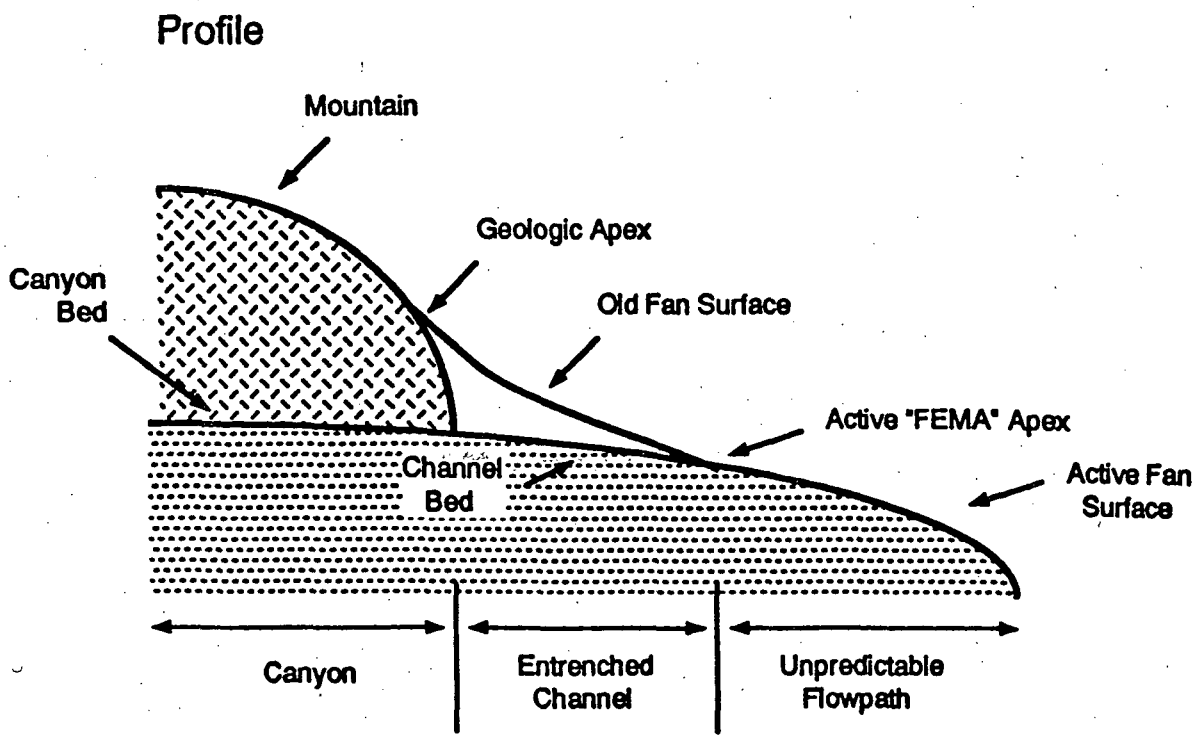


Figure 3: Idealized Alluvial Fan Profile.

2.3 CP-North Alluvial Fan

CP-North Alluvial Fan, located west of the proposed Area 6 LWTS, develops from a channel that collects flow from a drainage area (LWTS1, 0.61-square miles) along the eastern front of the CP Hills (Figure 3 and Sheet 1) and drains to the fan apex. Another small drainage area (LWTS2, 0.11-square miles) drains onto the alluvial fan just south of the apex, and therefore is not included in the apex discharge. The alluvial fan itself is divided into two separate subbasins: LWTS3 (0.47-square miles) and LWTS4 (0.20-square miles). Although CP-North Alluvial Fan extends to the southwestern edge of Yucca Lake, a secondary alluvial fan, News Nob Alluvial Fan (see Section 2.4, *News Nob Alluvial Fan*), has formed east of Mercury Highway on the distal part of CP-North Alluvial Fan (the outermost area, or lower zone of the fan). The fan morphology of this second fan controls the hydraulics within the LWTS5 subbasin (0.28-square miles).

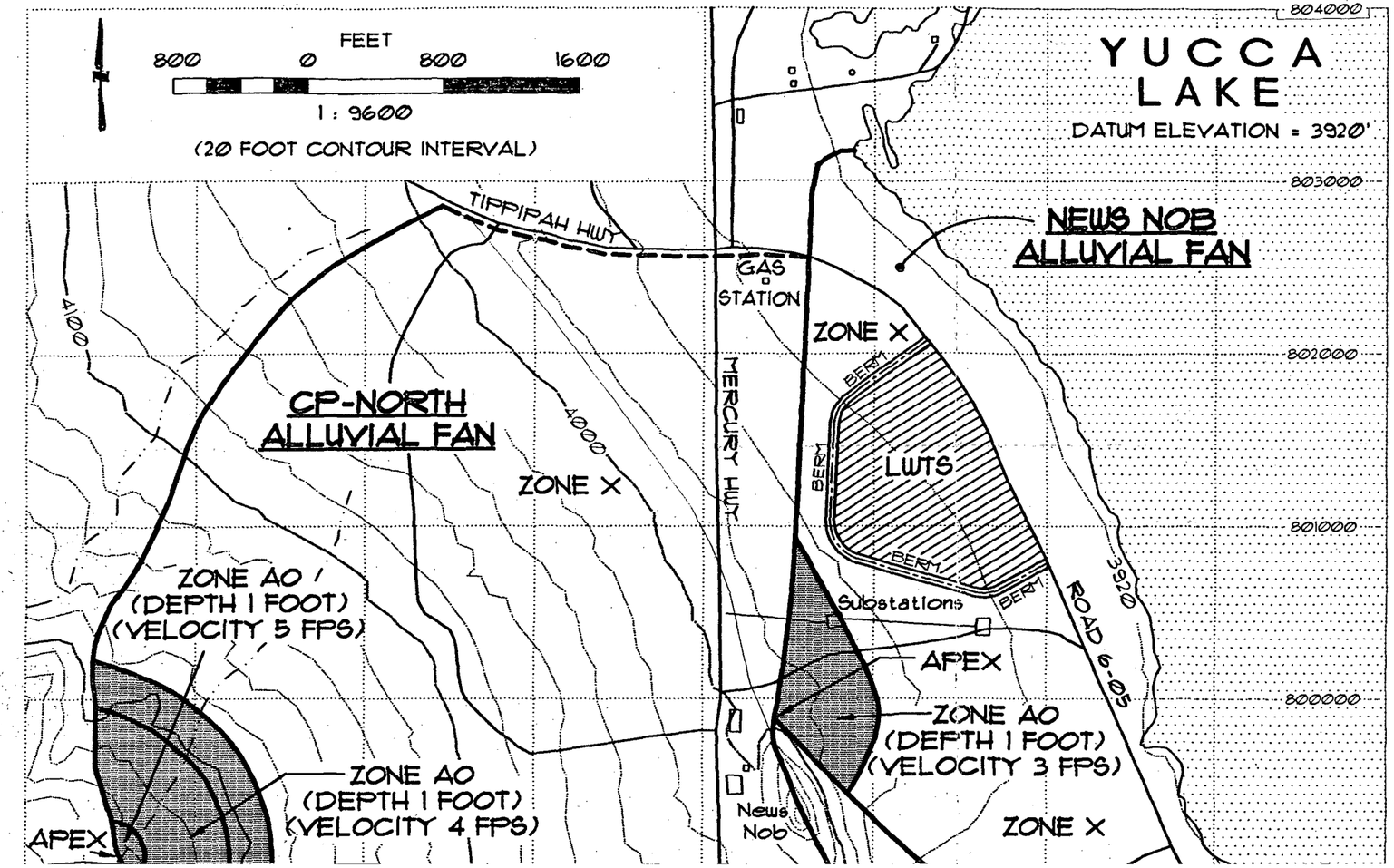
The channel located above the apex of the CP-North Alluvial Fan is incised 2 to 3 feet in depth. The apex of the fan was located where the flowpath of the channel becomes unpredictable. Below the apex, erosion is the primary geomorphological process occurring in the proximal part of the fan (the area on the alluvial fan near the apex), as indicated by the braided channel system that has developed. Channel incision of 1.5 to 3 feet in depth and desert pavement and/or desert varnish found on surfaces between channels indicates that this system is relatively stable. Vegetation cover density is approximately 35-40 percent.

Continued channel incision in the proximal part of the fan has shifted deposition to a distal part of the fan. Channels are incised 1 to 2 feet in depth and desert pavement and/or desert varnish are less developed and are found less frequently on this distal part of the fan. Vegetation cover density is approximately 25-30 percent.

2.4 News Nob Alluvial Fan

The proposed Area 6 LWTS will be constructed on News Nob Alluvial Fan, a secondary fan of CP-North Alluvial Fan. This secondary fan has developed east of Mercury Highway where flow from CP-North Alluvial Fan and subbasins LWTS2 and LWTS3 are concentrated at News Nob. LWTS5 subbasin encompasses the entire secondary fan area. Because the proposed LWTS is to be constructed near the apex of this fan, on-fan precipitation (LWTS5) was considered negligible in the discharge that will impact the facility.

Most of this fan surface has channels with depths less than 1 foot, relatively little desert pavement and/or desert varnish, and vegetation cover density approximately 25-30 percent. The exception is one channel, located south of the facility site, that has incised approximately 0.5 to 3 feet in depth from the apex at News Nob to the 6-05 Road.



EXPLANATION

ALLUVIAL FAN BOUNDARY

ALLUVIAL FAN BOUNDARY CREATED BY MAN-MADE FLOW OBSTRUCTION

ZONE AO (DEPTH 2 FT) (VELOCITY 5 FPS) — FEMA ALLUVIAL FAN 100-YEAR FLOOD ZONE DESIGNATION THAT CORRESPONDS TO AREAS OF 100-YEAR SHALLOW FLOODING WHERE AVERAGE DEPTHS ARE BETWEEN 1 AND 3 FEET. ANYWHERE THROUGHOUT THE ZONE THERE IS AN EQUALLY LIKELY CHANCE THAT A CHANNEL CAN OCCUR OF THE DESIGNATED DEPTH WITH A FLOW OF THE DESIGNATED VELOCITY.

ZONE X — FEMA FLOOD ZONE DESIGNATION THAT CORRESPONDS TO AREAS OUTSIDE THE 100-YEAR ALLUVIAL FAN FLOOD HAZARD AND TO AREAS OF 100-YEAR SHEETFLOW FLOODING WHERE AVERAGE DEPTHS ARE LESS THAN 1 FOOT.

LWTS — PROPOSED AREA 6 LIQUID WASTE TREATMENT SYSTEM (LWTS)

3.0 HYDROLOGY: LWTS SUBBASINS

3.1 Methods

Standard statistical methods to determine flood discharges for a specific return period are not applicable to a majority of the watersheds in the arid Southwest because most of the watersheds in this region are ungaged and do not have stream discharge information. Furthermore, arid watersheds that do have discharge data usually have a short period of record with many years of no flow.

In the arid Southwest, rainfall-runoff models are often used to estimate flood discharges. In this flood assessment, rainfall-runoff models were developed using the HEC-1 computer program developed by the U.S. Army Corps of Engineers (COE) (1990a). The *Clark County Hydrologic Criteria and Drainage Design Manual* (CCRFCD Manual) (Clark County Regional Flood Control District [CCRFCD], 1990) lists the HEC-1 computer program as an acceptable tool to estimate discharges and to generate hydrographs for watersheds within Clark County, Nevada.

The hydrologic approach described in the CCRFCD Manual (1990) was developed for Clark County from studies conducted by WRC Engineering and the COE. The methods described in the CCRFCD Manual (1990) were considered the best approach for estimating discharges for the flood assessment of the proposed Area 6 LWTS for these reasons:

- The physical setting and flood-producing storms for the proposed LWTS are similar to those of Clark County;
- The study area is in close proximity to Clark County;
- Local and federal agencies (e.g., FEMA) accept the methods in the CCRFCD Manual (1990); and,
- Clark County is the nearest local jurisdiction with a hydrologic method based on region-specific information.

The Soil Conservation Service (SCS) unit hydrograph option in the HEC-1

- lag time; and,
- channel routing parameters.

The procedure used to obtain these parameters generally followed methods described in the CCRFCD Manual (1990). The following sections provide an overview of how these parameters were determined and substantiate any deviations from the methods provided in the CCRFCD Manual (1990).

3.1.1 Precipitation

Rainfall events that cause flooding on the NTS and in southern Nevada are usually convectional storms. According to Christenson and Spahr (1980), the probable flood-generating storm in the NTS area would be from summer convectional storms.

These flood-producing storms are normally characterized as short-duration (6 hours or less), high-intensity storms over a localized area. Methods regarding precipitation parameters in the CCRFCD Manual (1990) assume that summer convectional storms are the likely precipitation event to produce flooding in Clark County. In an analysis of precipitation records for southern Nevada, WRC Engineering and the COE determined that a 6-hour rainfall should be the design storm (CCRFCD Manual, 1990). A 6-hour mass curve (intensity of rainfall per 15-minute intervals over the 6-hour design storm) was developed and a relationship between precipitation depth and storm size (depth-area ratios) was determined. These parameters are discussed in the following sections in more detail.

a. Point Precipitation Values: As specified in the CCRFCD Manual (1990), the design depths of precipitation for the 6-hour storm were taken from National Oceanic and Atmospheric Administration (NOAA) Atlas 2, Volume VII (U.S. Department of Commerce [DOC], 1973) and are listed under the "NOAA Values" caption of Table 1.

Table 1. Six-Hour Storm Point Precipitation Values and Correction Factors (Modified from CCRFCD Manual, 1990).

Six-Hour Storm	NOAA Values (inches)	Correction Factor	Corrected Point Rainfall (inches)
2-year	0.70	1.00	0.70
10-year	1.10	1.24	1.36
25-year	1.30	1.33	1.73
100-year	1.60	1.43	2.43

The 100-year, 6-hour point precipitation value of 1.6-inches (NOAA Atlas 2, Volume VII, [DOC] 1973) compares well with the 1.8-inch value generated from a figure developed by French (1983) for the Cane Springs precipitation gauge (Figure 5). A preliminary value of 2.6-inches for the 100-year, 24-hour storm was taken from a statistical analysis of the rainfall data at Well 5b by Reynolds Electrical & Engineering Co., Inc., (personal communication, Barker, 1992), and also compares well with the 2.8-inch value listed in NOAA Atlas 2, Volume VII (DOC, 1973).

The CCRFCD Manual (1990) requires that point precipitation values listed in NOAA Atlas 2, Volume VII (DOC, 1973) be used to determine point precipitation; however, the CCRFCD Manual (1990) specifies that rainfall events above the 2-year storm be adjusted. Table 1 shows correction factors listed in the CCRFCD Manual (1990). These correction factors were identified from studies conducted by WRC Engineering and the COE for

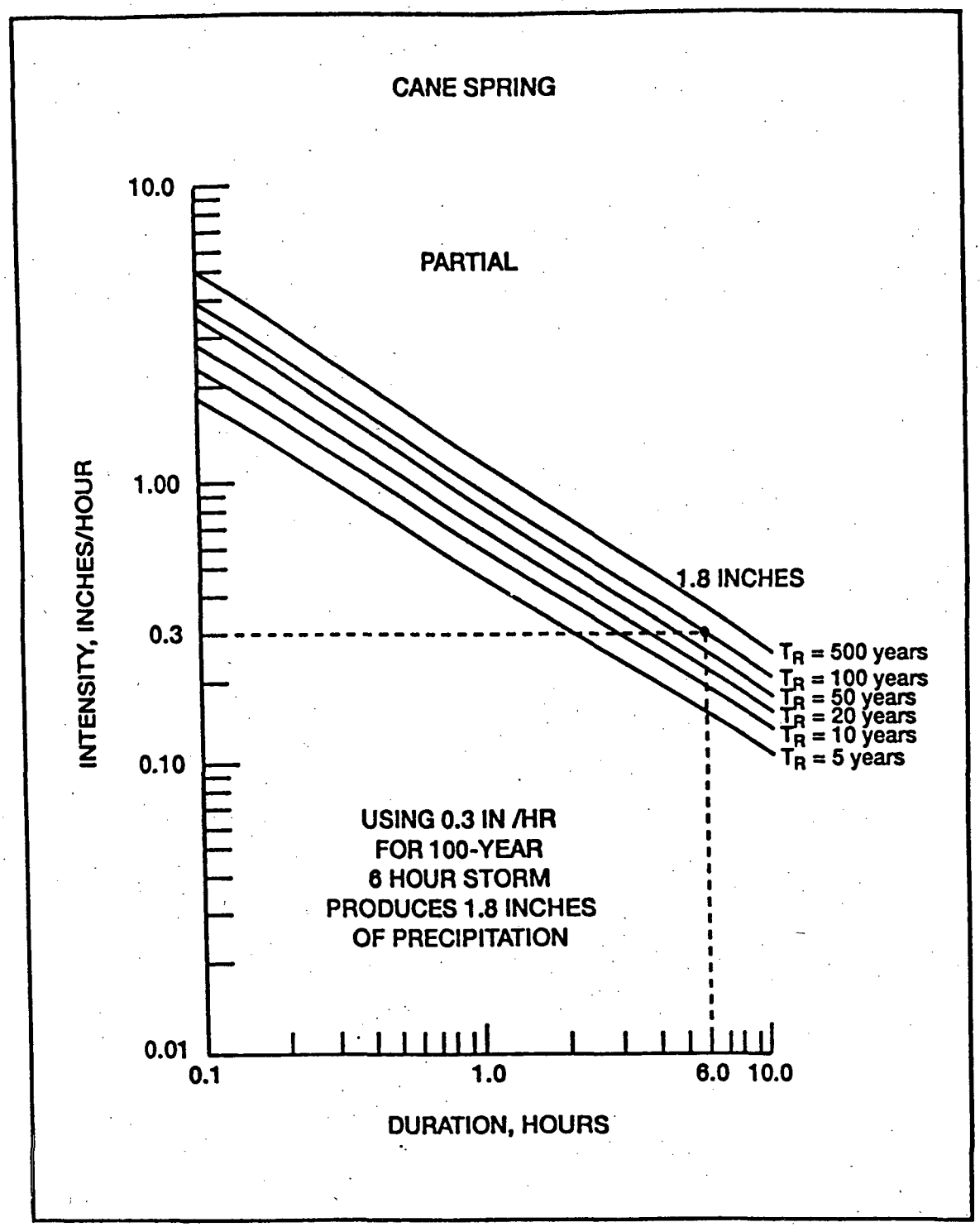


Figure 5. Intensity Duration Relationships for Various Return Periods, Cane Springs, Nevada Test Site, Nevada (Modified from French, 1983).

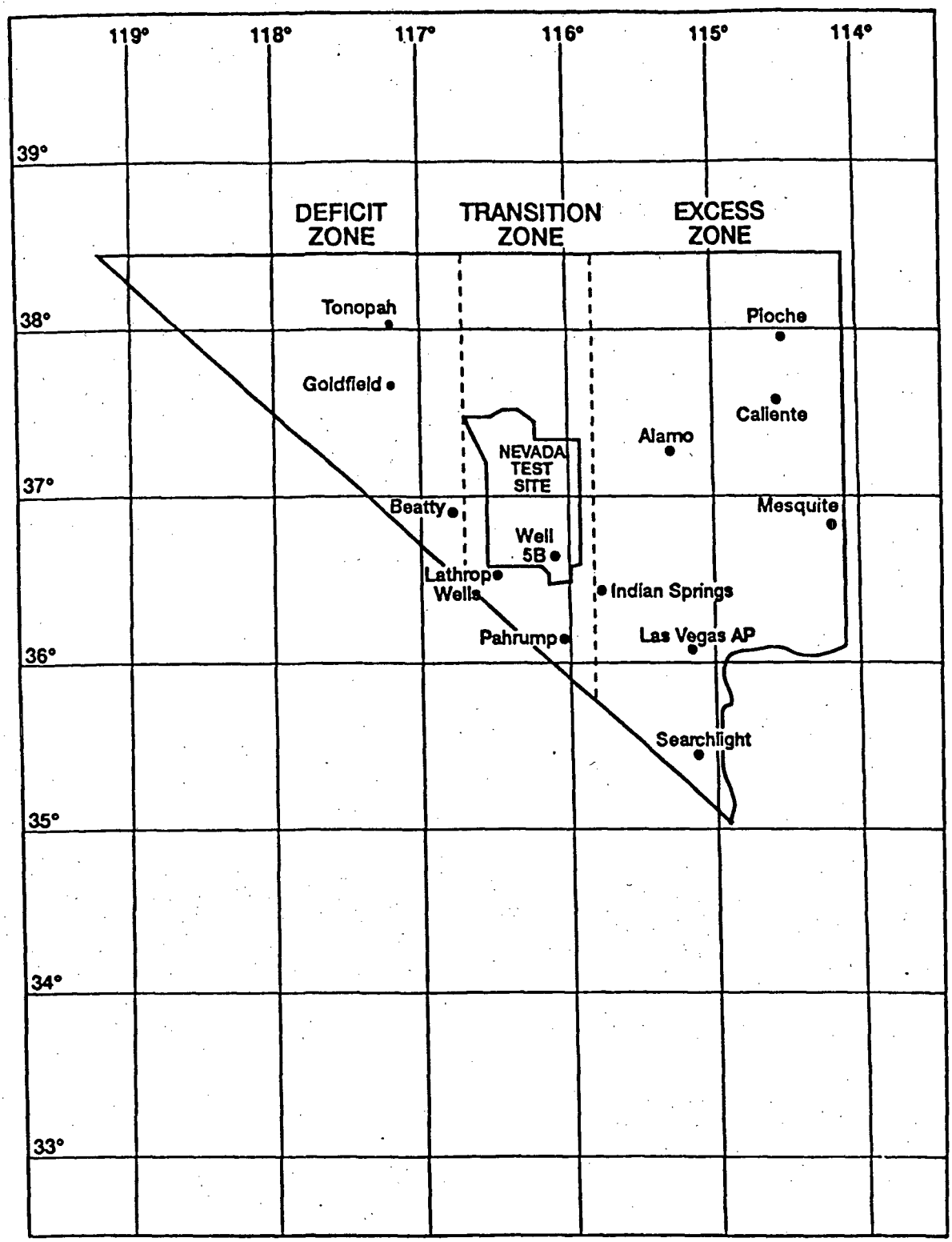
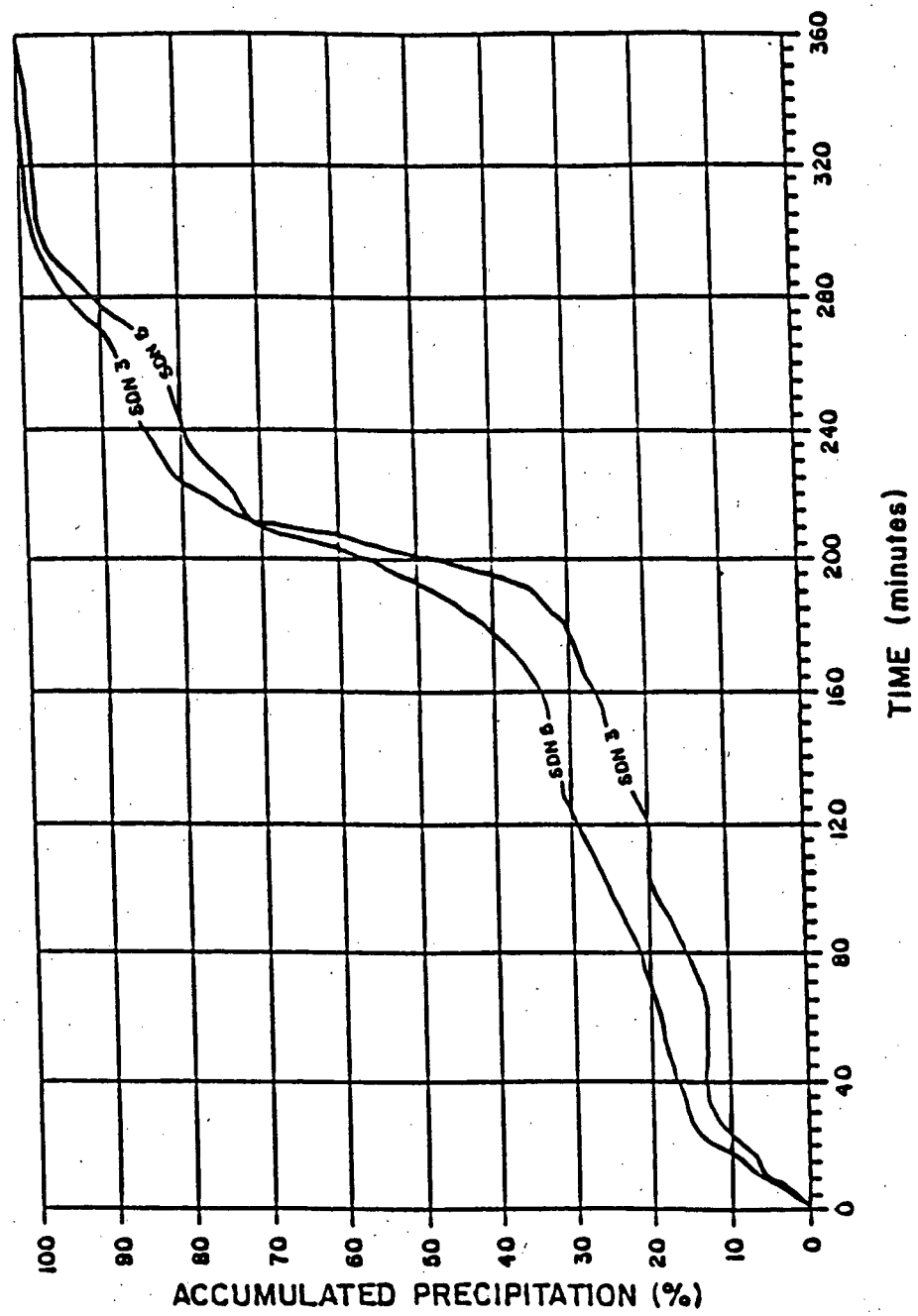


Figure 6. Hypothesized Zones of Precipitation in Southern Nevada (Modified from French, 1983).

SIX-HOUR DESIGN STORM DISTRIBUTIONS



Notes:

1. For drainage areas less than 10 square miles in size, use SDN 3.
2. For drainage areas equal to or greater than 10 square miles in size, use SDN 5.

Figure 7. Storm Distributions (CCRFCD Manual, 1990).

Table 2. Six-Hour Precipitation Depth-Area Reduction Factors (CCRFCD Manual, 1990).

Drainage Area (mi^2)	Reduction Factor	Point Precipitation Values (inches) for Given Return Intervals			
		100-Year	25-Year[1]	10-Year	2-Year
.01	1.00	1.6	1.3	1.1	0.70
1	0.97	1.55	1.26	1.07	0.68

[1] 25-year, 6-hour storm

3.1.2 Drainage Areas

The Yucca Flat watershed was delineated using 7.5- and 30x60-minute United States Geological Survey (USGS) topographic quadrangle maps. The LWTS subbasins were delineated using the Yucca Lake (1986) 7.5-minute USGS topographic quadrangle map. Drainage basin delineations were verified by study of color aerial photos, and for the LWTS subbasins, by field observations. The areas of the Yucca Flat watershed and the LWTS subbasins were determined using a planimeter. The USGS topographic quadrangle maps used to define the drainage areas are:

7.5-minute Topographic Quadrangles (USGS):

-Quartet Dome (1962)
-Mine Mountain (1986)
-Oak Spring (1986)
-Tippipah Spring (1952)
-Paiute Ridge (1986)
-Rainier Mesa (1986)
-Plutonium Valley (1986)
-Yucca Flat (1986)
-Oak Spring Butte (1962)
-Yucca Lake (1986)
-Jangle Ridge (1986)

30x60-minute Topographic Quadrangles (USGS):

-Indian Springs (1988)
-Pahute Mesa (1979)
-Beatty (1986)
-Pahranagat Ridge (1985)

3.1.3 Precipitation Losses

Precipitation losses were determined using the SCS curve number method and the applicable table (Table 3) found in the CCRFCD Manual (1990). The following information is required to determine a curve number for a specific subbasin:

- hydrologic soil group;
- vegetation type; and
- percent vegetation cover.

Table 3. Runoff Curve Numbers (Semiarid Rangelands[1]) [modified from CCRFCD Drainage Manual, 1990].

Cover Description		Curve Numbers for Hydrologic Soil Group			
Cover Type	Hydrologic Condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element	Poor	--	80	87	93
	Fair	--	71	81	89
	Good	--	62	74	85
Oak-aspen—mountain brush mixture of	Poor	--	66	74	79
	Fair		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bitter brush, maple, and other brush	Good	--	30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory	Poor	--	75	85	89
	Fair	--	58	73	80
	Good	--	41	61	71
Sagebrush with grass understory	Poor	--	67	80	85
	Fair	--	51	63	70
	Good	--	35	47	55
Desert shrub—major plants include	Poor	63	77	85	88

The following procedures were used to obtain this information:

1. The percent of bedrock and alluvium was determined for LWTS subbasins using aerial photos and geologic and topographic maps. Bedrock areas of the subbasins were assigned as hydrologic soil group D. This soil group has high runoff potential and applies to areas with shallow soils or exposed bedrock. The alluvium is mostly sand and was assigned as hydrologic soil group B based on field investigation.

2. The cover type for the subbasins was determined to be desert shrub based on descriptions given in *Table 3*, field investigation, and study of aerial color and infrared photos.

3. The hydrologic condition was determined to be poor based on field investigation and study of color aerial photos. Vegetation cover was estimated at less than 30 percent (*Table 3*). Because of the steep slopes and minimal or nonexistent soil, bedrock areas have less vegetation than alluvial areas; therefore, the hydrologic condition of the bedrock areas was also classified as poor.

According to the CCRFCD Manual (1990), curve numbers for precipitation losses should be determined assuming an antecedent moisture condition of II (AMC–II). Antecedent moisture condition is dependent on the antecedent rainfall. The antecedent rainfall is the amount of rainfall between 5 and 30 days preceding a flood–producing storm. AMC–I assumes the soil is dry, and AMC–III assumes the soil is near or at saturation; AMC–II is halfway between AMC–I and AMC–III. The CCRFCD Manual (1990) designates AMC–II because data required to determine the antecedent moisture condition for an entire area are not quantifiable.

Assuming AMC–II, curve numbers for the alluvium and bedrock were 77 and 88, respectively. The curve number for each subbasin was determined by taking the weighted average between the percentage of alluvium and bedrock present in each subbasin (Appendix B). Curve numbers for LWTS subbasins are listed in Table 4. Hydrologic models in this study developed to estimate the 2–, 10- and 25–year, 6-hour discharges assumed antecedent moisture conditions ranging from AMC–II to AMC-III. The 100–year, 6-hour and 25-year, 24-hour hydrologic models developed for this study assumed AMC–III conditions. Results from all the models and the justification for varying the curve numbers per antecedent moisture conditions are addressed in Section 3.4, *Hydrology Discussion*.

Table 4. Subbasin Curve Numbers.

Subbasin Name	Subbasin Area (mi^2)	Curve Numbers for Given Return Interval				
		100-Year	25[1]-Year	10-Year	2-Year	25[2]-Year
LWTS1	0.61	94	88	87	87	94
LWTS2	0.11	95	89	88	88	95
LWTS3	0.47	87	80	78	77	87
LWTS4	0.20	87	80	78	77	87
LWTS5	0.28	N/A	N/A	N/A	N/A	N/A

[1] 25-year, 6-hour storm
[2] 25-year, 24-hour storm

3.1.4 Lag Time

In the SCS unit hydrograph method, only one input parameter, the lag time, is required. The CCRFCD Manual (1990) uses the lag time equation from the U.S. Bureau of Reclamation (Cudworth, 1989):

$$TLag = 20K_n\left(\frac{LL_c}{S^{1/2}}\right)^{1/3}$$

TLag = the lag time (hours) between the center of mass of rainfall excess and the peak of the unit hydrograph.

K_n = the Manning roughness factor (dimensionless) for the basin channels.

L = the length of the longest watercourse (miles) within the subbasin.

L_c = the length along the longest watercourse (miles) measured upstream to a point opposite the centroid of the basin.

S = the average slope of the longest watercourse (feet per mile).

As indicated in the CCRFCD Manual (1990), K_n is subjective. Therefore, criteria listed in the CCRFCD Manual (1990) (Table 5) are recommended and were used for this study. Characteristics of the subbasins fell between the "n" value description for 0.03 and 0.05.

Table 5. Lag Equation Roughness Factors (Modified from CCRFCD Manual, 1990).

Watershed Characteristics	Roughness Factor, K_n
sewer, and improved channels.	
Natural Areas: Water courses in the drainage area are well defined, unimproved channels or washes. Watershed has minimal vegetation.	0.030
Natural Areas: Water courses in the drainage area are not well defined, and consist of many small rills and braided wash areas. Runoff from area combines slowly into channels. Includes mountainous channels with large boulders and flow restrictions.	0.050

Parameters used to determine the lag times for the LWTS subbasins are listed in Table

3.1.5 Channel Routing

The Muskingum routing method was used for routing reaches. This routing method requires three parameters: x, K, and the integer step. The weighting factor (x) expresses the amount of attenuation of the flood wave within the reach (Dunne and Leopold, 1978), and was determined using criteria cited by the Cudworth (1989). The Muskingum coefficient (K) accounts for the translation of the peak flow for the entire channel reach. This storage constant, K, is directly related to the length and the average velocity of the reach. The average channel velocity is determined using the Manning Equation. The Manning roughness coefficient was chosen based on field observations. Channel geometry was determined through field measurements. (The integer step and routing reach were determined so that the total travel time through the reach would be equal to K.) Only two reaches were routed in the models. Table 7 lists the routing parameters for these reaches.

Table 7. Routing parameters used in the Muskingum routing method.

Reach Name	Integer Step[1]	Storage Constant[2] (K)	Weighting Factor[3] (X)
LWTS1 to CPA	4	0.08	0.20
LWTS2 to CPA	4	0.09	0.20

[1] **Integer Step**: The integer step is the number of subreaches for the Muskingum routing.

[2] **Storage Constant (K)**: The Muskingum "K" coefficient is the travel time (hours) through the reach.

[3] **Weighting Factor (X)**: The weighting factor expresses the amount of attentuation of the flood wave within the reach.

Transmission losses for the routing reaches are ignored in the models. Variability of infiltration rates along a channel reach can be extensive; thus, these losses over an entire reach are difficult to quantify. Ignoring these losses adds another conservative assumption into the model.

3.2 Hydrologic Models

Five hydrologic models were developed using the HEC-1 computer program (COE, 1990a) to determine discharges for the LWTS subbasins in this flood assessment. All the

models have the same hydrologic parameters, with the exceptions of point precipitation values and curve numbers. Differences between the models are explained in each model description found in Table 8 and in Section 3.4, *Hydrology Discussion*. Output from the five hydrologic models are in Appendix C.

3.2.1 Model Layout

The overall watershed that could impact the proposed LWTS was divided into 5 subbasins to provide discharges at key locations and concentration points. Figure 8 is a schematic showing how the subbasins were connected in the HEC–1 models. The model layout was the same for all models.

3.2.2 Concentration Points

The concentration point locations were determined to provide discharges at the most appropriate location for the hydraulic analysis (*Figure 2 and Sheet 1*). Concentration points were selected at the active apex (CPA) of and along the northwestern edge (CPB) of News Nob Alluvial Fan. In the case of CPB, sheetflow conditions require that this concentration point be spread across the entire area of potential flood impact with the proposed LWTS.

3.3 Hydrology Results

The 2-, 10-, 25-, and 100-year, 6-hour discharges for the LWTS subbasins were generated by the HEC-1 model (COE, 1990a) (*Appendix C*) and verified by a comparison of skew coefficients generated by the FEMA FAN model (1990) (Appendix D). The 500-year, 6-hour discharge was then extrapolated by the FEMA FAN model (1990) from the model-produced flood frequency curve. The 25-year, 24-hour discharge for the LWTS subbasins (*Appendix C*) was also generated by the HEC-1 model, but was not verified using the FEMA FAN model (1990). The 2-, 10-, 25-, and 100-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour discharges for the proposed LWTS are shown in Table 9.

3.4 Hydrology Discussion

The FEMA FAN model (1990) was used to verify the model-generated discharges for the 2-, 10-, 25-, and 100-year, 6-hour floods. This step compared the skew coefficient developed from model-generated discharges and the regional skew coefficient (U.S. Water Resource Council Bulletin-17B [WRC-17B], 1981). If the hydrologic models are producing reasonable discharges, then the skew coefficient from these models should be close to the regional skew coefficient.

100-Year Hydrologic Models	
100YRLWA.OUT	Model used for determining flood hazard at proposed LWTS. Curve numbers for bedrock-dominant subbasins were increased by 7; curve numbers for alluvium-dominant subbasins were increased by 10. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
100YRLW9.OUT	Model used to determine appropriate curve number increase for bedrock-dominant subbasins. Curve numbers for bedrock-dominant subbasins were increased by 7; curve numbers for alluvium-dominant subbasins were not increased. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
100YRLW7.OUT	Model used as baseline subbasin delineation/curve number determination. No increases were made to curve numbers in any subbasins. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
25-Year Hydrologic Models	
25YRLW8.OUT	Model used for determining flood hazard at proposed LWTS. Curve numbers for bedrock-dominant subbasins were increased by 1; curve numbers for alluvium-dominant subbasins were increased by 3. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
25YRLW7.OUT	Model used to determine appropriate curve number increase for bedrock-dominant subbasins. Curve numbers for bedrock-dominant subbasins were increased by 1; curve numbers for alluvium-dominant subbasins were not increased. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
25YRLW6.OUT	Model used as baseline subbasin delineation/curve number determination. No increases were made to curve numbers in any subbasins. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
10-Year Hydrologic Models	
10YRLW6.OUT	Model used for determining flood hazard at proposed LWTS. Curve numbers for bedrock-dominant subbasins were not increased; curve numbers for alluvium-dominant subbasins were increased by 1. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
10YRLW5.OUT	Model used as baseline subbasin delineation/curve number determination. No increases were made to curve numbers in any subbasins. Point precipitation values were taken from NOAA Atlas 2, Volume VII.
2-Year Hydrologic Model	
2YRLW3.OUT	Model used for determining flood hazard at proposed LWTS. No increases were made to curve numbers in any subbasins. Point precipitation values were taken from NOAA Atlas 2, Volume VII.

Table 8. Hydrologic Models.

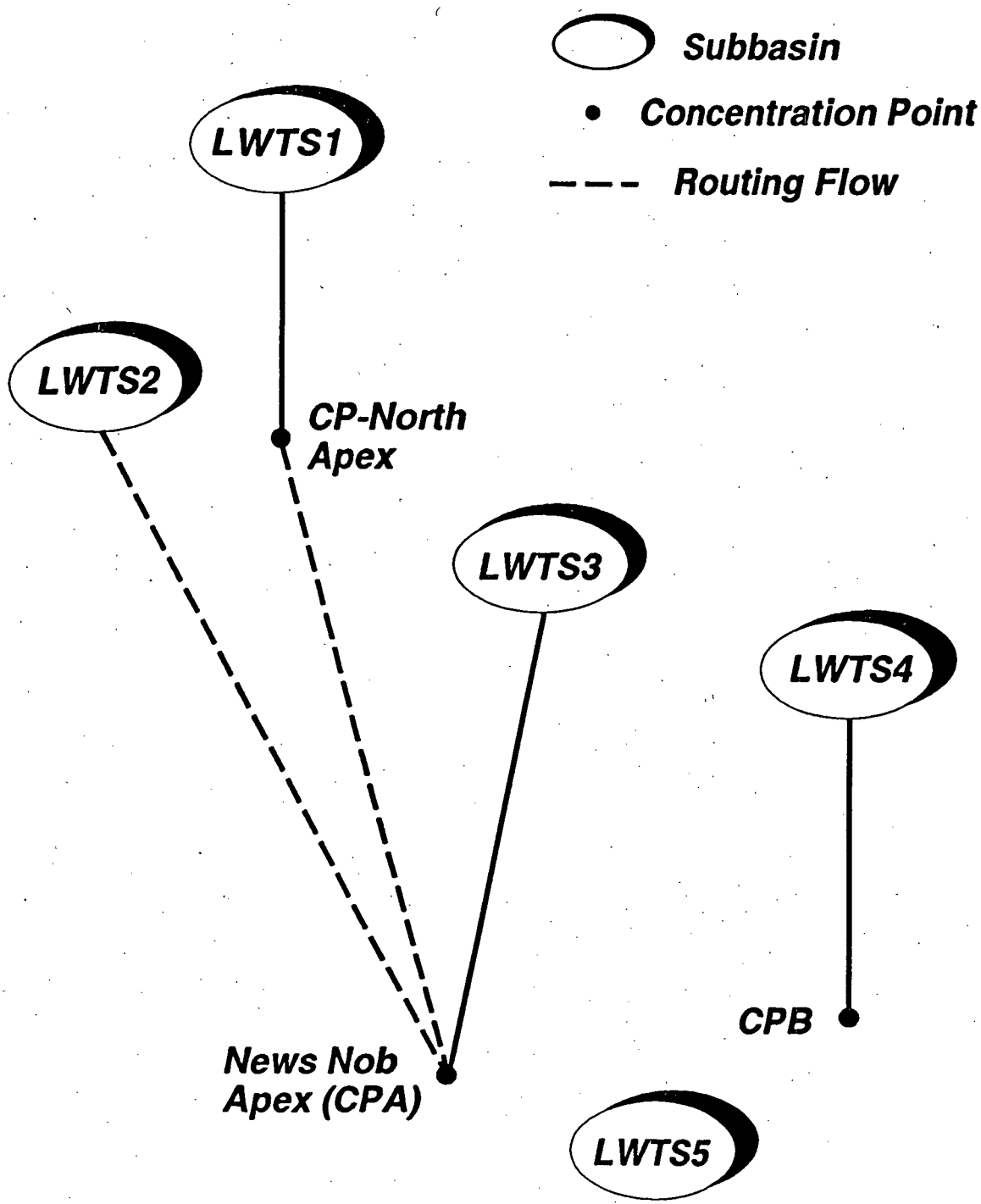


Figure 8. Schematic Diagram of Subbasin Network.

Table 9. HEC-1 model-generated discharges (cubic-feet per second) at key locations.

Location	Discharges (cfs) for Given Return Intervals					
	2-year	10-year	25[1]-year	100-year	500-year	25[2]-year
CP-NAPX[3]	26	101	235	375	754	586
NNAPX[4]/CPA	28	131	359	591	1332	912
CPB	1	10	45	103	396	198

[1] 25-year, 6-hour storm

[2] 25-year, 24-hour storm

[3] CP-North Alluvial Fan Apex

[4] News Nob Alluvial Fan Apex

A major assumption in using skew coefficients is that the relationship between discharge and return period must follow a Log-Pearson Type III (LP3) probability distribution, as specified by WRC-17B (1981). The FEMA FAN model (1990) contains a subroutine that calculates skew coefficients using a least-square fit and a LP3 probability distribution. This program requires discharges for a minimum of three return periods to calculate the skew coefficient.

WRC-17B (1981) contains a map which shows the regional skew coefficients for the country (Figure 9). According to information on this map, the skew coefficient for the washes on the NTS should be near zero. A zero skew coefficient means that if discharge versus probability was plotted on log-probability paper, then the flood frequency curve would plot as a log-normal distribution (a straight line). Preliminary results from a study by the USGS using stream gage data gathered after 1981 also support a zero skew for this region (Hjalmarson [personal communication], 1992).

A three-step approach was taken to develop reasonable hydrologic models for the LWTS subbasins. The formation of News Nob Alluvial Fan as a secondary fan downstream from the apex of CP-North Alluvial Fan requires that a skew coefficient comparison be done at both apexes to develop appropriate discharges for bedrock-dominant subbasins above CP-North Alluvial Fan apex and alluvium-dominant subbasins above News Nob Alluvial Fan apex, and to account for the discharge contribution from the upstream apex of CP-North Alluvial Fan to the apex of News Nob Alluvial Fan.

Three model sets were evaluated using the skew coefficient comparison approach. The first model set, Model Set 1, included the 2-, 10-, 25-, and 100-year, 6-hour models (2YRLW3, 10YRLW5, 25YRLW6, and 100YRLW7, respectively). This model set was developed as a baseline model set using the methods recommended in the CCRFCD Manual (1990). Discharges from both fan apexes in these models were entered into the FEMA FAN model (1990) to determine the skew coefficients (*Appendix D*). The skew coefficients corresponding to either apex (Table 10) were not close to zero; therefore, discharges at both apexes in this set must be adjusted to move the skew coefficients closer to zero. The 2- and 10-year models were determined to generate reasonable results; therefore, adjustment must occur either to the 25- and/or 100-year, 6-hour models.

Table 10. Skew Coefficients From Different Model Sets (6-hour storms) .

	Skew Coefficients		
	Model Set 1	***Model Set 2***	***Model Set 3***
CP-North	-1.0	0.0	0.0
News Nob	-1.0	-0.3	0.0

Return Period	**Model Set 1**	**Model Set 2**	**Model Set 3**
2-year Model	2YRLW3	2YRLW3	2YRLW3
10-year Model	10YRLW5	10YRLW5	10YRLW6
25-year Model	25YRLW6	25YRLW7	25YRLW8
100-year Model	100YRLW7	100YRLW9	100YRLWA

The 25- and 100-year, 6-hour hydrologic models can be modified by adjusting the curve numbers, depth of precipitation, or lag times. Of these three parameters, curve numbers have the widest variability because they are dependent on antecedent moisture conditions. Curve numbers for the subbasins in this study (*Table 3*) can range in the 50's and 60's under dry soil conditions (AMC-I) to the high 80's and low 90's (AMC-III) for saturated conditions. The CCRFCD Manual (1990) assumes AMC-II because antecedent moisture conditions for a drainage basin are impossible to quantify and a standard approach is required in Clark County to assure consistent analysis and design of drainage facilities and structures. The assumption of AMC-II may be reasonable for the 2- and 10-year flood events, as reflected in 2YRLW3 and 10YRLW5, respectively, but may not be for the 25- and 100-year flood events. For 10-year floods or greater, the antecedent moisture condition as well as rainfall may contribute to flooding.

Precipitation depth and lag times are not as variable. Variation from the precipitation depths in NOAA Atlas 2, Volume VII (DOC, 1973) is not supportable because precipitation data in the study area (French, 1983; and Barker [personal communication], 1992) do not vary substantially from the values in NOAA Atlas 2, Volume VII (DOC, 1973), and any variation to precipitation data would be difficult to support. Variability in lag time is limited because three of the four parameters (L, L_c, and S) are measured from a topographic map, and significant variations in the K_n are not defensible using the methods described in the CCRFCD Manual (1990) (*Table 5*). Therefore, the curve numbers in the models were considered the most reasonable parameter to modify.

Modification of curve numbers was evaluated by first making adjustments similar to those used by Schmeltzer and others (1993) in Area 5. In this second step, additional 25- and 100-year, 6-hour models (25YRLW7 and 100YRLW9, respectively) were created from the original models. This step was completed as a sensitivity analysis of curve

This third step, combining curve numbers developed in the second step above for CP-North Alluvial Fan apex and curve numbers developed in the sensitivity analysis at the News Nob Alluvial Fan apex, produced Model Set 3: 2YRLW3, 10YRLW6, 25YRLW8, and 100YRLWA. The 2-, 10-, 25-, and 100-year, 6-hour discharges at the apex of News Nob Alluvial Fan were entered into the FEMA FAN model (1990), and generated a zero skew coefficient (*Appendix D*).

Model Set 3 produced reasonable hydrologic models for the entire drainage basin impacting the proposed LWTS; therefore, the HEC-1 models in Model Set 3 were used to define the FEMA 100-year, 6-hour flood hazards in this flood assessment (Appendix E). The FEMA FAN model (1990) uses the skew coefficients to adjust the HEC-1 model-generated discharges to "best fit discharges." Best fit discharges would produce a zero skew coefficient, with the flood frequency curve plotting as a log-normal distribution (a straight line on log-probability paper). From this flood frequency curve, other return period discharges can be interpolated or extrapolated. The FEMA FAN model (1990) automatically interpolates a 50-year discharge and extrapolates a 500-year, 6-hour discharge. Model Set 3 was used in the FEMA FAN model (1990) to develop the flood

frequency curve used to extrapolate the 500-year, 6-hour discharges required in this flood assessment.

As a result of this three-step approach to determine the appropriate hydrologic models, nine models were developed but only four models (2YRLW3, 10YRLW5, 25YRLW8, and 100YRLWA) were used in determining the 6-hour storm flood hazards of the proposed LWTS. Although, the 25-year, 24-hour discharge for the LWTS subbasins was also generated by the HEC-1 computer program (COE, 1990a), it was not verified

- Determining lake water volume at these different elevations; and,
- Determining corresponding rainfall depth over entire Yucca Flat watershed.

A planimeter was used to measure the area of the playa lake bed and the surrounding low-lying areas at elevations of 3925 ft-msl, 3930 ft-msl, 3935 ft-msl, 3940 ft-msl, and 3945 ft-msl. This provided areas of water depths at 5 feet, 10 feet, 15 feet, 20 feet, and 25 feet, respectively, above the lake bed elevation of 3920 ft-msl.

Lake water volumes (Table 11) were then determined by converting planimeter area measurements to acres and multiplying by the corresponding water depths to calculate acre-feet (volume) of water at each elevation (Appendix F).

Rainfall depths were determined assuming that rainfall would occur over the entire approximately 300-square mile Yucca Flat watershed. To calculate the depth of rainfall that would be necessary to fill the lake to each specified water surface elevation, the calculated water volume (acre-feet) of Yucca Lake at each specified water surface elevation was divided by the total number of acres in the Yucca Flat watershed, resulting in a corresponding rainfall depth for each specified water surface elevation (*Appendix F*). This assumption is very conservative because it requires that the soil of the entire watershed be at or near saturation (AMC-III) to produce 100 percent run-off. This would require previous rainfall to have occurred to allow for infiltration prior to the rainfall that would lead to the run-off necessary to fill the lake.

Table 11. Calculated Yucca Lake water volumes.

Elevation (ft-msl)	Depth of water (ft)	Lake area (acres)	Lake volume (acre-ft)
3925	5	4982	24909
3930	10	6248	62477
3935	15	7437	111562
3940	20	8582	171643
3945	25	9523	238080

5.0 HYDRAULICS AND FLOOD HAZARD DETERMINATION

The proposed Area 6 LWTS is located in an arid region where traditional approaches to define flood hazards (e.g., the hydraulic model HEC-2 [COE, 1990b], which assumes a stable and fixed channel geometry) may not be appropriate for all types of flooding. Potential flooding of the proposed LWTS can occur as alluvial fan flooding, sheetflow, and/or the rising water level of Yucca Lake. FEMA has developed methods to determine

the 100-year flood hazards from alluvial fans and sheetflow; the method to determine the water surface elevations of Yucca Lake for the various return intervals was described in Section 4.0, *Hydrology: Yucca Lake*. These same methods were used to determine the 25-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour flood hazards from these same potential sources.

This section provides:

- a brief description of the FEMA methods used to evaluate alluvial fan flooding and sheetflow;
- a brief description of the method used to determine the water surface elevations of Yucca Lake;
- the results and discussion of the flood hazard evaluation; and
- flood hazard maps.

5.1 Hydraulics and Flood Hazard Determination: Methods

5.1.1 Alluvial Fan Flooding

Flooding from the CP-North and News Nob alluvial fans could impact the proposed LWTS facilities. Hydraulic processes on alluvial fans are different than in riverine channels. Alluvial fan flooding, as described by FEMA (1991), ". . . is characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flowpaths." Channel geometry and direction on alluvial fans can change in direct response to a flood discharge. Field investigations and study of topographic maps and aerial photos of the CP-North and News Nob alluvial fans support this description because flowpaths are unpredictable, soil development is weak, and evidence of recent erosion and deposition is present.

FEMA (1991) states that if flowpaths below the active apex cannot be predicted (which is the case for the CP-North and News Nob alluvial fans), the FEMA Alluvial Fan Method (FEMA AFM) must be applied to evaluate the 100-year flood hazard. This method, which is a modification of the method proposed by Dawdy (1979), relates probability of discharges at the apex to probability of channel depths and flow velocities that occur on the alluvial fan.

According to Dawdy (1979), flood flow from the apex of a typical alluvial fan does not spread evenly over the fan surface, but is instead confined to a surface or channel that carries the flood waters from the apex to the toe of the fan (Figure 10). The active apex is selected at the point where the flowpath becomes unpredictable, and flow is no more likely to follow an existing channel than create a new path. In the upper region of an alluvial fan, flow is confined to a single channel where the depth and width of the channel is a function of the flow itself. In general, flow occurs at critical depth and velocity as a

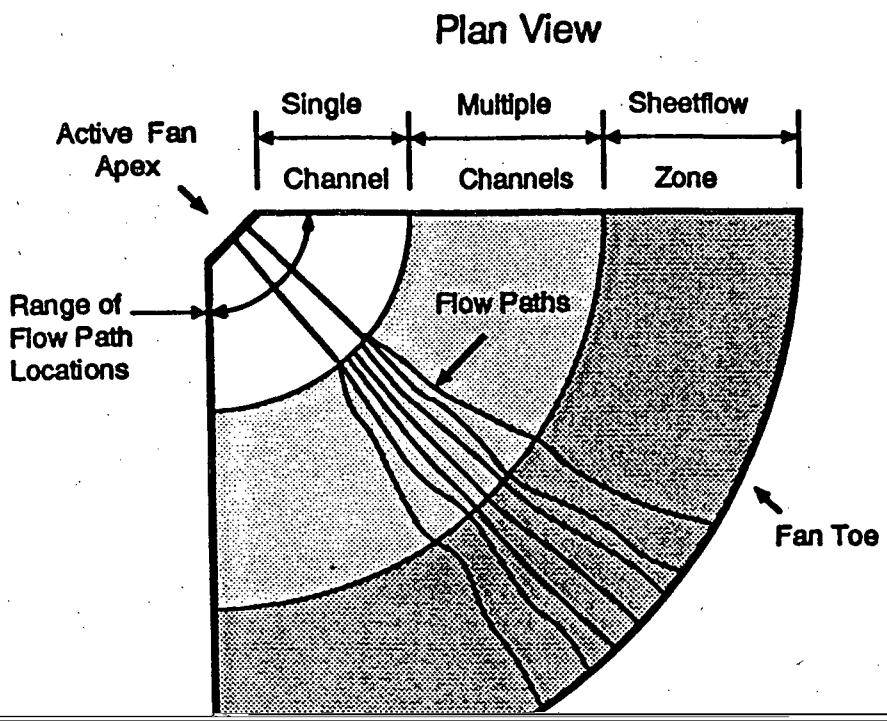
result of steep slopes associated with this upper region. As slopes decrease towards the mid and distal parts of the fans, channel bifurcation can occur resulting in a

his method. FEMA (1991) modified the Dawdy method to address multiple-channel regions of alluvial fans.

Key assumptions of the FEMA AFM follow (French, 1989):

1. The location of the flood event channel on the fan surface is random. Furthermore, the probability of the channel passing through any given point on a contour is uniform.

2. Flow occurs in flow-formed channels. Well-defined channels result from


Plan View
Single
Channel
Multiple
Channels
Sheetflow
Zone
Active Fan
Apex
Range of
Flow Path
Locations
Flow Paths
Fan Toe

Field observations, a study of topographic and geologic maps, aerial photographs, and examination of historic records were made during the flood assessment of these alluvial fans. Sources of flooding were defined, an apex selected, active fan boundaries delineated, entrenched reaches of channels located and measured, and locations of barriers to flow determined.

The method used for defining flood hazards on alluvial fans incorporates the FEMA FAN model (1990). Delineation of the 100-year flood hazard using the FEMA FAN model (1990) requires the following parameters and assumptions:

- Discharge information
- Apex location
- Fan boundaries and dimensions
- Potential flow obstructions and/or diversions
- Multiple channel region parameters:
  - Manning roughness coefficient
  - Slope

The FEMA FAN model (1990) requires that at least three discharges of different return periods be used to define the flood hazard zones. The 2-year, 10-year, 25-year, and 100-year, 6-hour flood discharges for the CP-North and News Nob alluvial fans were taken from the HEC-1 models labeled *2YRLW3.OUT*, *10YRLW6.OUT*, *25YRLW8.OUT*, and *100YRLWA.OUT*, respectively (*Tables 8 and 10*). Discharges used in the FEMA FAN model (1990) for CP-North Alluvial Fan were taken from the HEC-1 models (*Table 9 and Appendix C*) at the active apex (Subbasin LWTS1). Discharges for News Nob Alluvial Fan were taken from CPA as calculated within the HEC-1 models (*Table 9 and Appendix C*), and were assumed to have originated from the fan apex. All approaches for selecting discharges at the apexes are considered to be conservative.

Apex locations and fan boundaries were determined from aerial photographs; available topographic, geologic, and surficial maps; and field investigations. Apexes were located using the FEMA definition for an active apex. Location of the apexes for CP-North and News Nob alluvial fans are shown in *Figures 2 and 4* and Sheet 1.

Potential flow obstructions and diversions such as roads, buildings and other structures which can prevent flooding in some areas and increase flooding in others must be designated. In this flood assessment, all barriers such as Mercury Highway, secondary roads, geologic features, and all disturbed areas *diverting* flow away from the proposed LWTS were ignored. Quantification of the diversion would be difficult. Roads 6-02 and 6-04 were convenient to be used as the north and south boundaries of the distal part of CP-North Alluvial Fan (*Sheet 1*), potentially increasing discharges on downstream areas of the fan by limiting the fan contour width. Assuming that all flow can reach the proposed LWTS and limiting the width of the alluvial fan produces a more conservative flood analysis.

A Manning roughness coefficient of 0.040 was used for the multiple-channel regions of both fans. The Manning roughness coefficient for the multiple-channel regions of the

fan were determined from field observations, and confirmed using the descriptions and values found in tables developed by Chow (1959). Slope of the fans for the multiple-channel region parameters were determined from the Yucca Lake (1986) 7.5-minute USGS topographic quadrangle map.

5.1.2 Sheetflow

According to FEMA (1991), sheetflow

> ". . . is the broad, relatively unconfined downslope movement of water across sloping terrain that results from . . . a channel that crosses a drainage divide, . . . and overflow from a perched channel onto . . . plains of lower elevations . . . . [Sheetflow] is typical in areas of low topographic relief and poorly established drainage systems . . . . Shallow flooding is often characterized by poorly defined channels and highly unpredictable flow direction because of low relief or shifting channels and debris loads. Where such conditions exist, the entire area susceptible to this unpredictable flow should be delineated as an area of equal risk. Small-scale topographic relief that is not evident on existing topographic mapping and that might lead to "islands" of one flood hazard zone within larger areas of another should be ignored."

This definition of sheetflow describes the distal parts of the fans that drain from the CP Hills towards Yucca Lake. With current elevation information (20-foot contour interval) on topographic maps, a detailed assessment of the sheetflow flood hazard was not possible because of the inability to distinguish channels and nonchannel regions; therefore, per FEMA (1991) the 100-year flood hazard of this area was analyzed assuming that the entire area is prone to flooding and is delineated as an area of equal risk. Geomorphologic evidence gathered from analysis of color aerial photos and field observations supports this assumption because these areas have weak soil development and relatively few areas of relic deposits covered by desert pavement with desert varnish.

5.1.3 Yucca Lake

Calculated rainfall values necessary to fill the lake to the specified elevations were compared with the rainfall values used in the 25- and 100-year, 6-hour; and 25-year, 24-hour HEC-1 models, and with an 500-year, 6-hour estimated rainfall value (Appendix G). Flooding will occur at a given elevation if the rainfall value of a storm is greater than the rainfall value required to fill the lake to the specified elevation.

5.2 Results and Discussion of Flood Hazard Determination

Using the methods described in the previous section, the 100-year flood hazard areas were defined on topographic maps (*Figure 4 and Sheet 1*). Zone AO and Zone X were used to denote the flood hazards in the vicinity of the proposed LWTS.

FEMA designates alluvial fan and sheetflow areas with a 100-year flood depth of greater than 1 foot as a Zone AO. FEMA (1991) defines Zone AO as the area of 100-year shallow flooding where average depths are between 1 and 3 feet. For alluvial fans, anywhere throughout the zone there is a probability of 0.01 that a channel can occur at the designated depth with flow at the designated velocity. Zone X, shown on *Figure 4 and Sheet 1* represents areas outside the 100-year flood hazard and/or areas of the 100-year shallow flooding (sheetflow) where average depths are less than 1 foot. A Zone X delineation does not mean that floods will not occur within this zone. For this reason, flood hazard protection must be addressed.

5.2.1 Alluvial Fan Flooding

The 100-year flood hazard zones for the CP-North and News Nob alluvial fans are shown on *Figure 4 and Sheet 1*. This represents the 100-year flood hazard from these alluvial fans for the proposed LWTS.

Using the FEMA AFM, the proposed site of the LWTS, approximately one mile north of the Area 6 CP, is not located within the 100-year flood hazard zone from either CP-North or News Nob alluvial fans (100-year flow depths 1 foot or greater), but is located in the Zone X area of News Nob Alluvial Fan (100-year flow depths less than 1 foot). *Appendix E* contains the output of the FEMA FAN model (1990) results.

The review of field data; topographic, geologic, and surficial maps; and aerial photographs does not invalidate the assumptions of the FEMA AFM. However, other methods for determining flood hazards in arid regions are currently being developed. At the time of the writing of this report, none of these other methods have been adopted by FEMA; therefore, the FEMA methods were the only methods used.

5.2.2 Sheetflow

FEMA (1991) describes areas that experience sheetflow as Zone X (an area of 100-year flood depths less than 1 foot). Calculations to determine the average 100-year depths for sheetflow areas support this assertion. Calculated 100-year depths within the proposed LWTS vicinity were all less than 1 foot; therefore this facility is not located within a FEMA designated 100-year flood hazard zone from flow draining from the CP Hills. The calculated 25-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour depths were also less than 1 foot; therefore, the facility is not located within a 25-year, 6-hour; 25-year, 24-hour; or 500-year, 6-hour flood hazard zone from sheetflow. Appendix H contains calculations used to estimate the depth of flow in sheetflow regions.

5.2.3 Yucca Lake

As discussed in *Section 3.1.1., Precipitation*, rainfall events that typically cause flooding in southern Nevada and on the NTS are summer convectional storms, characterized as short-duration (6-hours or less), high-intensity storms over localized areas. This type of storm is inconsistent with storms that would generate runoff volumes necessary to fill Yucca Lake to the specified depths.

Table 12 summarizes the results of the calculations of lake area, water volume, and corresponding rainfall values (*Appendix F*).

Table 12. Calculated rainfall values.

Elevation (ft-msl)	Depth of water (ft)	Lake area (acres)	Lake volume (acre-ft)	Calculated Rainfall value (in)
3925	5	4982	24909	1.5
3930	10	6248	62477	3.8
3935	15	7437	111562	6.8
3940	20	8582	171643	10.5
3945	25	9523	238080	14.5

A comparison was made between calculated rainfall values necessary to fill the lake to the specified elevations with the rainfall values used in the 25- and 100-year, 6-hour and 25-year, 24-hour HEC-1 models, and with a 500-year, 6-hour estimated rainfall value (*Appendix G*). The 25-year, 6-hour rainfall value of 1.3-inches is less than the calculated rainfall values necessary to fill the lake for all specified elevations. Thus, the 25-year, 6-hour rainfall event would not produce enough runoff to create a water surface elevation higher than any of the specified elevations. The 100-year, 6-hour; 25-year, 24-hour; and estimated 500-year, 6-hour rainfall values of 1.6-inches, 2.0-inches, and 1.75-inches respectively, are greater than the calculated rainfall value for elevations less than 3925 ft-msl, but less than the calculated rainfall value at 3930 ft-msl. Thus, the 100-year, 6-hour; 25-year, 24-hour; and 500-year, 6-hour rainfall events would produce enough runoff to create a water surface elevation high enough to flood elevations less than approximately 3930 ft-msl. The facility must be located at approximately 3930 ft-msl or higher to be outside of the 500-year, 6-hour flood hazard of Yucca Lake.

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APPENDIX A

DOE/NV Letter to DOE/HQ

The Nevada Test Site (NTS) Area 5 Radioactive Waste Management Site (RWMS) has been, and the proposed Area 6 Liquid Waste Treatment System (LWTS) likely will be, classified as *Non-Reactor, Nuclear Facilities, Category 3* (Department of Energy (DOE) Order 5480.23, *Nuclear Safety Analysis Reports*). DOE Order 6430.1A, *General Design Criteria*, states that for a *Non-Reactor, Nuclear Facility, Category 3*, the 100-year base floodplain, 500-year flood, and Probable Maximum Flood (PMF) be determined, and that the PMF be used for purposes of facility design. Determination of some of these requirements is redundant, and in some cases for the arid and semi-arid southwestern United States, is impractical. Clarification by DOE Headquarters of the intent of DOE Order 6430.1A and its reasonable application to NTS facilities is immediately necessary for reasons given herein. Recommendations are presented herein that, if concurred and implemented, will provide this clarification.

Arid and semi-arid regions of the southwestern United States are particularly prone to flooding. Alluvial fans are prominent landforms in this region and represent a large flood hazard problem. Delineation of flood hazards and design of flood control structures on alluvial fans are essential and critical for facilities where human health and environmental protection are issues, especially with the recent development of storage and disposal sites for hazardous and/or radioactive wastes within the southwestern United States. Defense related waste is disposed at the NTS Area 5 RWMS by shallow land burial on coalescing alluvial fan surfaces. Above ground activities at facilities on these same surfaces include storage of hazardous wastes at the proposed Area 5 Hazardous Waste Storage Unit and treatment of wastes resulting from environmental restoration activities at the Area 6 proposed LWTS.

Traditional standard hydraulic approaches to define flood hazards generally are not appropriate for alluvial fan flooding. Federal Emergency Management Agency (FEMA)[1] describes alluvial fan flooding as being "...characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flowpaths." This type of flooding is less related to the magnitude of the flood and more related to the rapidity and intensity of the precipitation event. FEMA recognizes that hydraulic processes on alluvial fans are difficult to quantify and has designated alluvial fan flooding as a "special flood hazard" in 44 Code of Federal Regulations (CFR) Part 65: *Identification and Mapping of Special Hazard Areas*. Flood hazard zones are delineated using a method developed by Dawdy[2] and FEMA[3] to delineate 100-year flood hazards on alluvial fans.

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[1]Federal Emergency Management Agency, 1991. *Flood Insurance Study: Guidelines and Specifications for Study Contractors*. (FEMA 37) Washington, D.C. 100 pages.

[2]Dawdy, D.R., 1979. *Flood-Frequency Estimates on Alluvial Fans*. American Society of Civil Engineers, Journal of the Hydraulics Division, Vol. 105, No. HY-11. pp. 1407-1413.

[3]Federal Emergency Management Agency, 1990. *FAN: An Alluvial Fan Flooding Computer Program User's Manual and Program Disk*. Washington, D.C. Paginated by section.

Following DOE Order 6430.1A requirements, an assessment has been performed to determine the 100-year flood hazard from alluvial fans and associated channelized and sheet-type flows at the Area 5 RWMS and adjacent proposed HWSU, and is ongoing at the proposed Area 6 LWTS. This information is used to delineate flood hazard zones and produce FEMA-acceptable flood hazard zone maps. The 500-year discharges then can be extrapolated from the flood frequency curves generated in the determination of the 100-year floods.

The PMF can be generated using standard hydrologic modeling or estimated by assuming that it is greater than the Maximum Potential Flood (MPF) for the region. For the southwest, maximum potential flooding was estimated by Crippen and Bue[4] using discharges from maximum floods observed in the region. Theoretically, the PMF is the largest flood that can occur for a given area; therefore, the PMF value should be above the envelope curve developed from the MPF regional study.

Using the PMF as the design storm for facilities and flood control structures on the NTS is unrealistic and not economically feasible. In the case of the Area 5 RWMS and proposed HWSU, and the proposed Area 6 LWTS, the PMF discharges estimated using information from the MPF regional study are approximately 15 times greater than the discharge of the respective 500-year floods. At best, economically feasible flood control structures could be built to make such a facility survivable, but probably not keep it from being inundated by the large volume of water associated with the PMF. However, design of flood control structures is practical to keep a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3,* from being inundated by waters of the 500-year flood.

Executive Order (EO) 11988: *Floodplain Management* "...mandate[s] that Federal agencies avoid development, modifications or occupancy of [100-year] floodplains and wetlands where practical alternatives exist." Both 44 CFR Part 9*: Floodplain Management and Protection of Wetlands* and 10 CFR Part 1022*: Compliance with Floodplain/Wetlands Environmental Review Requirements* state that the base floodplain be the 100-year floodplain, except for "critical action" facilities, where the minimum floodplain of concern is the 500-year floodplain. 44 CFR Part 65 lists alluvial fan flooding as a "special flood hazard" and dictates that the 100-year flood hazard must be delineated. For existing facilities on the NTS, if a flood assessment is to be performed, it is recommended that the 100-year flood hazard be delineated as required by 44 CFR Parts 9 and 65, and in the case of either a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3*, that the 500-year flood hazard be delineated. If the existing facility is found to be located within a 100-year floodplain, or either a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3*, is found to be located within a 500-year floodplain, then FEMA design criteria will be used, including sediment transport calculations, to effectively remove the facility from the flood hazard.

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[4]Crippen, J.R., and Bue, C.D., 1977. *Maximum Floodflows in the Conterminous United States.* U.S. Geological Survey: Water Supply Paper 1887. Washington, D.C.

For future planned facilities on the NTS, it is recommended that they not be placed within the 100-year floodplain as mandated by EO 11988. In the case of either a "critical action" facility or a *Non-Reactor, Nuclear Facility, Category 3*, the 500-year flood hazard will be delineated. If such a proposed facility is found to be sited within a 500-year floodplain, then FEMA design criteria will be used, including sediment transport calculations, to effectively remove the facility from the 500-year flood hazard.

If further discussion is warranted concerning the recommendation to design *Non-Reactor, Nuclear Facilities, Category 3*, located on the NTS to the 500-year flood and not the PMF, as stated in DOE Order 6430.1A, a briefing on the complex issues of arid land hydrology, and specifically, alluvial fan hydraulics can be arranged.

Design schedules of the existing Area 5 RWMS and the proposed Area 6 LWTS will be adversely affected until the flood hazard assessment requirements listed in DOE Order 6430.1A for *Non-Reactor, Nuclear Facilities, Category 3*, are clarified. At present, 500-year flood control structure design surrounding the existing Area 5 RWMS and adjacent proposed HWSU is in the Conceptual Design Report stage. The proposed Area 6 LWTS facility is beginning early Title II design. Design and construction of these facilities should not continue until this clarification of DOE Order 6430.1A is made, unless major design changes and costs can be absorbed. Delay in completion of these projects will: (1) adversely impact the NTS environmental restoration program, including the Underground Test Area Program, because flood control is an integral part of the design of the proposed Area 6 LWTS, and (2) limit acceptance of low-level radioactive waste for disposal at the Area 5 RWMS. Such delays also would be undesirable in light of the recent focus by both the public and other government agencies on the NTS waste disposal activities.

APPENDIX B

Calculations of Hydrologic Parameters

Raytheon Services Nevada

Title: LWTS WATERSHED SUBBASIN AREAS

Job number 79002

Sheet _____ of _____

By JMW Date 8/19/94

MAP SCALE = 1:24000

LWTS1

$$4.22\ IN^2 \left(\frac{0.1435\ MI^2}{IN^2}\right) = 0.61\ MI^2$$

LWTS 2

$$0.79\ IN^2 \left(\frac{0.1435\ MI^2}{IN^2}\right) = 0.11\ MI^2$$

LWTS3

$$3.25\ IN^2 \left(\frac{0.1435\ MI^2}{IN^2}\right) = 0.47\ MI^2$$

LWTS4

$$1.40\ IN^2 \left(\frac{0.1435\ MI^2}{IN^2}\right) = 0.20\ MI^2$$

LWTS 5

$$1.94\ IN^2 \left(\frac{0.1435\ MI^2}{IN^2}\right) = 0.28\ MI^2$$

TOTAL AREA: 1.67 MI^2

Raytheon Services Nevada

Title: CURVE NUMBER CALCULATIONS

Job number LWT5
Sheet 1 of 2
By JM Date 8/23

CN ALLUVIUM = 77
CN BEDROCK = 88

LWT51

TOTAL AREA: 0.61 MI^2
BEDROCK AREA: 0.57 MI^2
ALLUVIUM AREA: 0.04 MI^2

BEDROCK: $0.57/0.61 = 0.93$

ALLUVIUM: $0.04/0.61 = 0.07$

$88(0.93) + 77(0.07) = 87$ ← LWT51 CN

LWT52

TOTAL AREA: 0.11 MI^2
BEDROCK AREA: 0.11 MI^2
ALLUVIUM AREA: 0.00 MI^2

BEDROCK $0.11/0.11 = 1.00$

$88(1.00) + 77(0.00) = 88$ ← LWT52 CN

LWT53

TOTAL AREA: 0.47 MI^2
BEDROCK AREA: 0.00 MI^2
ALLUVIUM AREA: 0.47 MI^2
ALLUVIUM $0.47/0.47 = 1.00$

$88(0.00) + 77(1.00) = 77$ ← LWT53 CN

Raytheon Services Nevada

Title: CURVE NUMBER CALCULATIONS, CONT

Job number LWTS
Sheet 2 of 2
By JW Date 8/23

LWTS4

TOTAL AREA: 0.20 MI²
BEDROCK AREA: 0.00 MI²
ALLUVIUM AREA: 0.20 MI²
ALLUVIUM: 0.20/0.20 = 1.00
88(0.00) + 77(1.00) = 77 ← LWTS4CN

LWTS5

Raytheon Services Nevada

Title: LAG TIME CALCULATIONS

Job number 79002
Sheet 1 of 2
By JW Date 8/19/94

$$T_{LAG} = 20\,K_n \left(\frac{L L_c}{S^{0.5}}\right)^{0.33}$$

T_{LAG} = LAG TIME (HRS)

K_n = MANNING ROUGHNESS COEFFICIENT

L = LENGTH OF LONGEST WATERCOURSE (MILES)

L_c = LENGTH OF LONGEST WATERCOURSE (MILES) OPPOSITE THE CENTROID OF THE BASIN.

S = AVERAGE SLOPE OF LONGEST WATERCOURSE (FT/MILE)

LWT51

K_n = 0.045 (NATURAL CHANNEL INTERPOLATION OF CCRFCD TABLE 6C

L = 1.25 MILES

L_c = 0.79 MILES

S = 460 FT / 1.25 MILES = 368 FT / MILE

T_{LAG} = 0.34 HOURS

LWT52

K_n = 0.045

L = 0.42 MILES

Raytheon Services Nevada

Title: [redacted]

Job number 79002

Sheet 2 of 2

[redacted]

LWTS3.

Kn = 0.04

L = 0.76 MI

Lc = 0.38 MI

S = 270 FT / 0.76 MILES = 355 FT / MILE

TLAG = 0.20 HOURS

LWTS4

Kn = 0.04

L = 0.72 MI

Lc = 0.34 MI

S = 170 FT / [illegible] = 630 FT /

Raytheon Services Nevada

Title: MUSKINGUM ROUTING MODEL

Job number 79002
Sheet 1 of 4
By JM Date 8/19/94

ESTIMATE OF TRAVEL TIME (K) FOR ROUTING REACHES

ROUTE LWTS1 THRU LWTS3 TO CPA

REACH 1 (ELEVATION 4260' TO CENTROID)

LENGTH = 2006 FT

SLOPE = 0.07 FT/FT

n = 0.04

Δ ELEVATION = 140 FT

DEPTH = 3.0 FT

WIDTH = 50 FT

MANNING'S EQUATION

$$V = \left(1.49/n\right) R^{2/3} S^{1/2}$$

WHERE R = AREA (A)/WETTED PERIMETER (P)

AREA = 50(3.0) = 150 FT²

WETTED PERIMETER = 3.0 + 50 + 3.0 = 56 FT

R = A/P = 150/56 = 2.68 FT

$$V = \left(1.49/0.04\right)(2.68)^{2/3}(0.07)^{1/2} = 19.02 \text{ FT/SEC}$$

TIME = LENGTH/VELOCITY

TIME = 2006/19.02 = 105.5 SEC

$$\text{TIME} = 105.5 \text{ SEC}\left(\frac{1 \text{ HR}}{3600 \text{ SEC}}\right) = \underline{0.03 \text{ HR}}$$

REACH 2 (CENTROID TO ELEVATION 3990')

LENGTH = 2006 FT

SLOPE = 0.065 FT/FT

n = 0.04

Δ ELEVATION = 130 FT

DEPTH = 1.5 FT

WIDTH = 15 FT

AREA = 1.5(15) = 22.5 FT²

WETTED PERIMETER = 1.5 + 15 + 1.5 = 18 FT

R = 1.25 FT

$$V = \left(1.49/0.04\right)(1.25)^{2/3}(0.065)^{1/2} = 11.02 \text{ FT/SEC}$$

REACH 2, CONT

TIME = 2006/11.02 = 182.0 SEC

TIME = 182.0 SEC $\left(\frac{1\ HR}{3600\ SEC}\right)$ = 0.05 HR

TOTAL TRAVEL TIME TO ROUTE LWTS1 TO CPA:

0.03 + 0.05 = 0.08 HR

NUMBER OF STEPS (NSTPS) REQUIRED FOR MUSKINGUM ROUTING IN HEC-1 MODEL USING X = 0.2 (WEIGHTING FACTOR)

TRAVEL TIME (K) = 0.08 HRS
ΔT = 0.02 HRS (1 MIN)
X = 0.2

NUMBER OF STEPS (NSTPS)

$$NSTPS = \frac{K}{\Delta T} = \frac{0.08}{0.02} = 4.0 \text{ STEPS}$$

ASSUME USE NSTPS = 4

CHECK FOR STABILITY (USCOE HEC-1 PG 40)

$$\frac{1}{2(1-X)} \le \frac{K}{NSTPS(\Delta T)} \le \frac{1}{2X}$$

$$\frac{1}{2(1-0.2)} \le \frac{0.08}{4(0.02)} \le \frac{1}{2(0.2)}$$

$$0.625 \le 1 \le 2.5$$

∴ 4 STEPS OKAY

ROUTING INFO: NSTPS = 4
K = 0.08
X = 0.2

ESTIMATE OF TRAVEL TIME (K) FOR ROUTING REACHES

ROUTE LWT52 THRU LWT53 TO CPA

REACH 1 (ELEVATION 4250' TO CENTROID-4120')

LENGTH = 2200 FT
SLOPE = 0.06 FT/FT
n = 0.04

ΔELEVATION = 130 FT
DEPTH = 3.0
WIDTH = 50 FT

AREA = 150 FT²
WETTED PERIMETER = 56 FT
R = 2.68 FT

$$V = \left(\frac{1.49}{0.04}\right)(2.68)^{2/3}(0.06)^{1/2} = 17.60 \text{ FT/SEC}$$

TIME = 2200 FT / 17.60 FT = 125.0 SEC

$$\text{TIME} = 125.0 \text{ SEC}\left(\frac{1 \text{ HR}}{3600 \text{ SEC}}\right) = \underline{0.03 \text{ HR}}$$

REACH 2 (CENTROID TO ELEVATION 3990')

LENGTH = 2200 FT
SLOPE = 0.06 FT/FT
n = 0.04

ΔELEVATION = 130 FT
DEPTH = 1.5 FT
WIDTH = 15 FT

AREA = 22.5 FT²
WETTED PERIMETER = 18 FT
R = 1.25 FT

$$V = \left(\frac{1.49}{0.04}\right)(1.25)^{2/3}(0.06)^{1/2} = 10.59 \text{ FT/SEC}$$

REACH 2, CONT

TIME = 2200 FT / 10.59 = 207.7 SEC

TIME = 207.7 SEC $\left(\frac{1 \text{ HR}}{3600 \text{ SEC}}\right)$ = 0.06 HR

TOTAL TRAVEL TIME TO ROUTE LWTS2 TO CPA:

0.03 HR + 0.06 HR = 0.09 HR

NUMBER OF STEPS (NSTPS) REQUIRED FOR MUSKINGUM ROUTING IN HEC-1 MODEL USING X = 0.2 (WEIGHTING FACTOR)

TRAVEL TIME (K) = 0.09 HRS
ΔT = 0.02 HRS (1 MIN)
X = 0.2

$$NSTPS = \frac{K}{\Delta T} = \frac{0.09}{0.02} = 4.5 \text{ STEPS}$$

ASSUME USE NSTPS = 4

CHECK FOR STABILITY

$$\frac{1}{2(1-0.2)} \leq \frac{0.09}{4(0.02)} \leq \frac{1}{2(0.2)}$$

$$0.625 \leq 1.13 \leq 2.5$$

∴ 4 STEPS OKAY

ROUTING INFO: NSTPS = 4
K = 0.09
X = 0.2

APPENDIX C

HEC-1 Model Output

HEC-1 MODEL OUTPUT
USED FOR DISCHARGE CALCULATIONS

100-Year, 6-Hour: 100YRLWA
25-Year, 6-Hour: 25YRLW8
10-Year, 6-Hour: 10YRLW6
2-Year, 6-Hour: 2YRLW3

25-Year, 24-Hour: 2524LW3

HEC-1 MODEL

100-Year, 6-Hour

100YRLWA

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  10/06/94  TIME  05:46:34   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:23AUG94  FILE:100YRLWA.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   100-YEAR 6-HOUR STORM 1.6 INCHES
  4           ID   POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
  8           ID   CURVE NUMBERS FOR ALLUVIUM DOMINANT WATERSHEDS (LWTS3 AND LWTS4) ADJUSTED +10
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     450
 11           IO       5
 12           IN       5
 13           JD     1.6     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 21           PC    99.8    99.9   100.0
 22           JD    1.55       1
 23           JD    1.38    9.99
              *

 24           KK   LWTS1
 25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE FOR APEX OF FAN 1
              *
 26           BA    0.61
              * CURVE NUMBER ADJUSTED +7
 27           LS              94
 28           UD    0.34
              *

 29           KK  RTCPA1
 30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 31           RM       4     .08      .2
              *
```

```
 32          KK   LWTS2
 33          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 34          BA    0.11
             * CURVE NUMBER ADJUSTED +7
 35          LS              95
 36          UD    0.10
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 37          KK  RTCPA2
 38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 39          RM       4     .09     0.2
             *

 40          KK   LWTS3
 41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 42          BA    0.47
             * CURVE NUMBER ADJUSTED +10
 43          LS              87
 44          UD    0.20
             *
             *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 45          KK     CPA
 46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 47          HC       3
             *

 48          KK   LTWS4
 49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 50          BA    0.20
             * CURVE NUMBER ADJUSTED +10
 51          LS              87
 52          UD    0.17
             *
             *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
             *
 53          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   24       LWTS1
                V
                V
   29      RTCPA1
                .
                .
   32           .       LWTS2
                .           V
                .           V
   37           .      RTCPA2
                .           .
                .           .
   40           .           .       LWTS3
                .           .           .
                .           .           .
   45         CPA.......................
                .
                .
   48           .       LTWS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *            VERSION 4.0.1E             *
 *                                       *
 *  RUN DATE  10/06/94  TIME  05:46:34   *
 *                                       *
 *****************************************

 *****************************************
 *                                       *
 *    U.S. ARMY CORPS OF ENGINEERS       *
 *    HYDROLOGIC ENGINEERING CENTER      *
 *          609 SECOND STREET            *
 *       DAVIS, CALIFORNIA 95616         *
 *           (916) 551-1748              *
 *                                       *
 *****************************************
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                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:23AUG94  FILE:100YRLWA.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    100-YEAR 6-HOUR STORM 1.6 INCHES
                    POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
                    CURVE NUMBERS FOR ALLUVIUM DOMINANT WATERSHEDS (LWTS3 AND LWTS4) ADJUSTED +10
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

13 JD          INDEX STORM NO. 1
                     STRM       1.60  PRECIPITATION DEPTH
                     TRDA       0.01  TRANSPOSITION DRAINAGE AREA

14 PI            PRECIPITATION PATTERN
                 0.40    0.40    0.40    0.40    0.40    0.74    0.74    0.74    0.74    0.74
                 0.26    0.26    0.26    0.26    0.26    0.34    0.34    0.34    0.34    0.34
                 0.42    0.42    0.42    0.42    0.42    0.32    0.32    0.32    0.32    0.32
                 0.12    0.12    0.12    0.12    0.12    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.06    0.06    0.06    0.06    0.06    0.14    0.14    0.14    0.14    0.14
                 0.04    0.04    0.04    0.04    0.04    0.12    0.12    0.12    0.12    0.12
                 0.20    0.20    0.20    0.20    0.20    0.28    0.28    0.28    0.28    0.28
                 0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18
                 0.14    0.14    0.14    0.14    0.14    0.04    0.04    0.04    0.04    0.04
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.20    0.20    0.20    0.20    0.20
                 0.30    0.30    0.30    0.30    0.30    0.24    0.24    0.24    0.24    0.24
                 0.16    0.16    0.16    0.16    0.16    0.04    0.04    0.04    0.04    0.04
                 0.10    0.10    0.10    0.10    0.10    0.28    0.28    0.28    0.28    0.28
                 0.16    0.16    0.16    0.16    0.16    0.06    0.06    0.06    0.06    0.06
                 0.04    0.04    0.04    0.04    0.04    0.24    0.24    0.24    0.24    0.24
                 0.54    0.54    0.54    0.54    0.54    0.60    0.60    0.60    0.60    0.60
                 1.14    1.14    1.14    1.14    1.14    1.80    1.80    1.80    1.80    1.80
                 1.82    1.82    1.82    1.82    1.82    2.40    2.40    2.40    2.40    2.40
                 0.68    0.68    0.68    0.68    0.68    0.74    0.74    0.74    0.74    0.74
                 0.62    0.62    0.62    0.62    0.62    0.14    0.14    0.14    0.14    0.14
                 0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32
                 0.10    0.10    0.10    0.10    0.10    0.08    0.08    0.08    0.08    0.08
                 0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16
                 0.24    0.24    0.24    0.24    0.24    0.44    0.44    0.44    0.44    0.44
                 0.32    0.32    0.32    0.32    0.32    0.22    0.22    0.22    0.22    0.22
                 0.26    0.26    0.26    0.26    0.26    0.40    0.40    0.40    0.40    0.40
                 0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12
                 0.06    0.06    0.06    0.06    0.06    0.04    0.04    0.04    0.04    0.04
                 0.04    0.04    0.04    0.04    0.04    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
```

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 2

STRM 1.55 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04

0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	375.	3.77	65.	52.	52.	0.61		
+	ROUTED TO	RTCPA1	372.	3.85	65.	52.	52.	0.61		
+	HYDROGRAPH AT	LWTS2	114.	3.55	13.	10.	10.	0.11		
+	ROUTED TO	RTCPA2	109.	3.62	13.	10.	10.	0.11		
+	HYDROGRAPH AT	LWTS3	223.	3.63	29.	23.	23.	0.47		
+	3 COMBINED AT	CPA	591.	3.70	104.	84.	84.	1.19		
+	HYDROGRAPH AT	LTWS4	103.	3.60	13.	10.	10.	0.20		

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

HEC-1 MODEL

25-Year, 6-Hour

25YRLW8

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  10/06/94  TIME  05:48:42   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW8.DAT
  2           ID    1 MINUTE INTERVAL IN ITCARD
  3           ID    25-YEAR 6-HOUR STORM 1.3 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
  8           ID   CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +3 (ALLUVIUM)
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     450
 11           IO       5
 12           IN       5
 13           JD     1.3     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 21           PC    99.8    99.9   100.0
 22           JD    1.55       1
 23           JD    1.38    9.99
              *

 24           KK   LWTS1
 25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE  FOR APEX OF FAN 1
              *
 26           BA    0.61
              * CURVE NUMBER ADJUSTED +1
 27           LS              88
 28           UD    0.34
              *

 29           KK  RTCPA1
 30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 31           RM       4     .08      .2
              *
```

```
          32          KK   LWTS2
          33          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
          34          BA    0.11
                      * CURVE NUMBER ADJUSTED +1
          35          LS              89
          36          UD    0.10
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          37          KK  RTCPA2
          38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          39          RM      4     .09     0.2
                      *

          40          KK   LWTS3
          41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          42          BA    0.47
                      * CURVE NUMBER ADJUSTED +3
          43          LS              80
          44          UD    0.20
                      *
                      *   CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          45          KK     CPA
          46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          47          HC      3
                      *

          48          KK   LWTS4
          49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          50          BA    0.20
                      * CURVE NUMBER ADJUSTED +3
          51          LS              80
          52          UD    0.17
                      *
                      * DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
                      *
          53          ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24       LWTS1
                 V
                 V
    29      RTCPA1
                 .
                 .
    32           .       LWTS2
                 .           V
                 .           V
    37           .      RTCPA2
                 .           .
                 .           .
    40           .           .       LWTS3
                 .           .           .
                 .           .           .
    45         CPA.......................
                 .
                 .
    48           .       LWTS4

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*              MAY   1991                 *
*           VERSION 4.0.1E                *
*                                         *
*  RUN DATE  10/06/94  TIME  05:48:42     *
*                                         *
*****************************************

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

```
                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW8.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    25-YEAR 6-HOUR STORM 1.3 INCHES
                   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
                   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
                   CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +3 (ALLUVIUM)
                   NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

13 JD          INDEX STORM NO. 1
                     STRM       1.30  PRECIPITATION DEPTH
                     TRDA       0.01  TRANSPOSITION DRAINAGE AREA

14 PI            PRECIPITATION PATTERN
                 0.40   0.40   0.40   0.40   0.40   0.74   0.74   0.74   0.74   0.74
                 0.26   0.26   0.26   0.26   0.26   0.34   0.34   0.34   0.34   0.34
                 0.42   0.42   0.42   0.42   0.42   0.32   0.32   0.32   0.32   0.32
                 0.12   0.12   0.12   0.12   0.12   0.00   0.00   0.00   0.00   0.00
                 0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
                 0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
                 0.06   0.06   0.06   0.06   0.06   0.14   0.14   0.14   0.14   0.14
                 0.04   0.04   0.04   0.04   0.04   0.12   0.12   0.12   0.12   0.12
                 0.20   0.20   0.20   0.20   0.20   0.28   0.28   0.28   0.28   0.28
                 0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18
                 0.14   0.14   0.14   0.14   0.14   0.04   0.04   0.04   0.04   0.04
                 0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.20   0.20   0.20   0.20   0.20
                 0.30   0.30   0.30   0.30   0.30   0.24   0.24   0.24   0.24   0.24
                 0.16   0.16   0.16   0.16   0.16   0.04   0.04   0.04   0.04   0.04
                 0.10   0.10   0.10   0.10   0.10   0.28   0.28   0.28   0.28   0.28
                 0.16   0.16   0.16   0.16   0.16   0.06   0.06   0.06   0.06   0.06
                 0.04   0.04   0.04   0.04   0.04   0.24   0.24   0.24   0.24   0.24
                 0.54   0.54   0.54   0.54   0.54   0.60   0.60   0.60   0.60   0.60
                 1.14   1.14   1.14   1.14   1.14   1.80   1.80   1.80   1.80   1.80
                 1.82   1.82   1.82   1.82   1.82   2.40   2.40   2.40   2.40   2.40
                 0.68   0.68   0.68   0.68   0.68   0.74   0.74   0.74   0.74   0.74
                 0.62   0.62   0.62   0.62   0.62   0.14   0.14   0.14   0.14   0.14
                 0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32
                 0.10   0.10   0.10   0.10   0.10   0.08   0.08   0.08   0.08   0.08
                 0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16
                 0.24   0.24   0.24   0.24   0.24   0.44   0.44   0.44   0.44   0.44
                 0.32   0.32   0.32   0.32   0.32   0.22   0.22   0.22   0.22   0.22
                 0.26   0.26   0.26   0.26   0.26   0.40   0.40   0.40   0.40   0.40
                 0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12
                 0.06   0.06   0.06   0.06   0.06   0.04   0.04   0.04   0.04   0.04
                 0.04   0.04   0.04   0.04   0.04   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.00   0.00   0.00   0.00   0.00
                 0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.00   0.00   0.00   0.00   0.00
```

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 2

STRM 1.55 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14

0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	235.	3.78	39.	32.	32.	0.61		
+	ROUTED TO	RTCPA1	233.	3.87	39.	32.	32.	0.61		
+	HYDROGRAPH AT	LWTS2	67.	3.55	7.	6.	6.	0.11		
+	ROUTED TO	RTCPA2	64.	3.63	7.	6.	6.	0.11		
+	HYDROGRAPH AT	LWTS3	107.	3.67	15.	12.	12.	0.47		
+	3 COMBINED AT	CPA	359.	3.78	63.	51.	51.	1.19		
+	HYDROGRAPH AT	LWTS4	45.	3.63	6.	5.	5.	0.20		

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

HEC-1 MODEL

10-Year, 6-Hour

10YRLW6

```
1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.0.1E               *                    *          609 SECOND STREET            *
*                                         *                    *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE  10/06/94  TIME  05:50:45     *                    *           (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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW6.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   10-YEAR 6-HOUR STORM 1.1 INCHES
  4           ID   POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   BASELINE -- BEDROCK CURVE NUMBERS NOT ADJUSTED
  8           ID   ALLUVIUM CURVE NUMBERS (LWTS3 AND LWTS4) ADJUSTED +1
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     450
 11           IO       5
 12           IN       5
 13           JD     1.1     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 21           PC    99.8    99.9   100.0
 22           JD    1.07       1
 23           JD     .95    9.99
              *

 24           KK   LWTS1
 25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 26           BA    0.61
 27           LS              87
 28           UD    0.34
              *

 29           KK  RTCPA1
 30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 31           RM       4     .08      .2
              *

 32           KK   LWTS2
 33           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 34           BA    0.11
```

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          35          LS              88
          36          UD    0.10
                      *

          37          KK  RTCPA2
          38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          39          RM       4     .09      .2
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          40          KK   LWTS3
          41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          42          BA    0.47
                      * ADJUST CURVE NUMBER +1
          43          LS              78
          44          UD    0.20
                      *
                      *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          45          KK     CPA
          46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          47          HC       3
                      *

          48          KK   LWTS4
          49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          50          BA    0.20
                      * ADJUST CURVE NUMBER +1
          51          LS              78
          52          UD    0.17
                      *
                      *  DISCHARGE FROM CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
                      *
          53          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24       LWTS1
                 V
                 V
    29      RTCPA1
                 .
                 .
    32           .       LWTS2
                 .           V
                 .           V
    37           .      RTCPA2
                 .           .
                 .           .
    40           .           .       LWTS3
                 .           .           .
                 .           .           .
    45         CPA.......................
                 .
                 .
    48           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *            VERSION 4.0.1E             *
 *                                       *
 *  RUN DATE  10/06/94  TIME  05:50:45   *
 *                                       *
 *****************************************

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

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                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW6.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    10-YEAR 6-HOUR STORM 1.1 INCHES
                    POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    BASELINE -- BEDROCK CURVE NUMBERS NOT ADJUSTED
                    ALLUVIUM CURVE NUMBERS (LWTS3 AND LWTS4) ADJUSTED +1
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA

                    IDATE      1    0  STARTING DATE
                    ITIME        0000  STARTING TIME
                       NQ         450  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1    0  ENDING DATE
                   NDTIME        0729  ENDING TIME
                   ICENT           19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

13 JD          INDEX STORM NO. 1
                    STRM        1.10  PRECIPITATION DEPTH
                    TRDA        0.01  TRANSPOSITION DRAINAGE AREA

14 PI            PRECIPITATION PATTERN
                    0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                    0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                    0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                    0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                    0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                    0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                    0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                    0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                    0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                    0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                    0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                    0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                    0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                    0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                    0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                    0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                    1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                    1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                    0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                    0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                    0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                    0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
```

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 0.95 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00

0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02

1

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	LWTS1	101.	3.82	17.	14.	14.	0.61		
+	ROUTED TO	RTCPA1	100.	3.90	17.	14.	14.	0.61		
+	HYDROGRAPH AT	LWTS2	36.	3.55	4.	3.	3.	0.11		
+	ROUTED TO	RTCPA2	34.	3.63	4.	3.	3.	0.11		
	HYDROGRAPH AT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
	3 COMBINED AT	CPA	131.	3.85	24.	19.	19.	1.19		
+	HYDROGRAPH AT	LWTS4	10.	3.72	2.	1.	1.	0.20		

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

HEC-1 MODEL

2-Year, 6-Hour

2YRLW3

```
1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.0.1E               *                    *          609 SECOND STREET            *
*                                         *                    *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE  10/06/94  TIME  07:08:04     *                    *           (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

```
1                                          HEC-1 INPUT                                                    PAGE  1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID    2-YEAR 6-HOUR STORM 0.7 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     0.7     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD     .68       1
 22           JD     .60    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
 32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33           BA    0.11
 34           LS              88
```

```
 35          UD    0.10
             *

 36          KK  RTCPA2
 37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 38          RM       4     .09      .2
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 39          KK   LWTS3
 40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 41          BA    0.47
 42          LS              77
 43          UD    0.20
             *
             * CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 44          KK     CPA
 45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 46          HC       3
             *

 47          KK   LWTS4
 48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 49          BA    0.20
 50          LS              77
 51          UD    0.17
             *
             *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
             *
 52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW


                V
                V
   28       RTCPA1
                .
                .
   31           .       LWTS2
                .           V
                .           V
   36           .      RTCPA2
                .           .
                .           .
   39           .           .       LWTS3
                .           .           .
                .           .           .
   44         CPA.......................
                .
                .
   47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*            VERSION 4.0.1E            *
*                                      *
*  RUN DATE  10/06/94  TIME  07:08:04  *
*                                      *
****************************************

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

LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
1 MINUTE INTERVAL IN ITCARD
 2-YEAR 6-HOUR STORM 0.7 INCHES
```

```
                    POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL    0.02 HOURS
                    TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                     STRM       0.70  PRECIPITATION DEPTH
                     TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                  0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                  0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                  0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                  0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                  0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                  0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                  0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                  0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                  0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                  0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                  0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                  0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                  0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                  1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                  1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                  0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                  0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                  0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                  0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                  0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                  0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                  0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                  0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                  0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                  0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                  0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD          INDEX STORM NO. 2
                     STRM       0.68  PRECIPITATION DEPTH
                     TRDA       1.00  TRANSPOSITION DRAINAGE AREA

 0 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.60 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	26.	3.90	5.	4.	4.	0.61		
+	ROUTED TO	RTCPA1	26.	3.98	5.	4.	4.	0.61		
+	HYDROGRAPH AT	LWTS2	11.	3.57	1.	1.	1.	0.11		
+	ROUTED TO	RTCPA2	10.	3.65	1.	1.	1.	0.11		
+	HYDROGRAPH AT	LWTS3	1.	4.98	0.	0.	0.	0.47		
+	3 COMBINED AT	CPA	28.	3.92	6.	5.	5.	1.19		
+	HYDROGRAPH AT	LWTS4	1.	4.95	0.	0.	0.	0.20		

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

HEC-1 MODEL

25-Year, 24-Hour

2524LW3

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  09/08/94  TIME  13:24:37  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    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    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:8SEPT94  FILE:2524LW3.DAT
  2           ID    1 MINUTE INTERVAL IN ITCARD
  3           ID    25-YEAR 24-HOUR STORM -- 2.0 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +7 (BEDROCK)
  8           ID   CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +10 (ALLUVIUM)
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     550
 11           IO       5
 12           IN       5
 13           JD     2.0     .01
              * RAINFALL DISTRIBUTION FOR 25-YEAR 24-HOUR STORM
 14           PC       0      .2      .5      .8     1.1     1.4     1.7     2.0     2.3     2.6
 15           PC     2.9     3.2     3.5     3.8     4.1     6.4     6.8     7.2     7.6     8.0
 16           PC     8.5     9.0     9.5    10.0    10.5    11.0    11.5    12.0    12.6    13.3
 17           PC    14.0    14.7    15.5    16.3    17.2    18.1    19.1    20.3    21.8    23.6
 18           PC    25.7    28.3    38.7    66.3    70.7    73.5    75.8    77.6    79.1    80.4
 19           PC    81.5    82.5    83.4    84.2    84.9    85.6    86.3    86.9    87.5    88.1
 20           PC    88.7    89.3    89.8    90.3    90.8    91.3    91.8    92.2    92.6    93.0
 21           PC    93.4    93.8    94.2    94.6    95.0    95.3    95.6    95.9    96.2    96.5
 22           PC    96.8    97.1    97.4    97.7    98.0    98.3    98.6    98.9    99.2    99.5
 23           PC    99.8   100.0
 24           JD     1.9     1.0
 25           JD     1.7    10.0
              *

 26           KK   LWTS1
 27           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE  FOR APEX OF FAN 1
              *
 28           BA    0.61
              * CURVE NUMBER ADJUSTED +7
 29           LS              94
 30           UD    0.34
              *

 31           KK  RTCPA1
 32           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
```

```
 33          RM       4     .08      .2
             *

 34          KK   LWTS2
 35          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 36          BA    0.11
             * CURVE NUMBER ADJUSTED +7
 37          LS              95
 38          UD    0.10
             *
1                                          HEC-1 INPUT                                          PAGE  2

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

 39          KK  RTCPA2
 40          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 41          RM       4     .09     0.2
             *

 42          KK   LWTS3
 43          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 44          BA    0.47
             * CURVE NUMBER ADJUSTED +10
 45          LS              87
 46          UD    0.20
             *
             *   CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 47          KK     CPA
 48          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 49          HC       3
             *

 50          KK   LWTS4
 51          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 52          BA    0.20
             * CURVE NUMBER ADJUSTED +10
 53          LS              87
 54          UD    0.17
             *
             * DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
             *
 55          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   26        LWTS1
                V
                V
   31       RTCPA1
                .
                .
   34           .        LWTS2
                .           V
                .           V
   39           .       RTCPA2
                .           .
                .           .
   42           .           .        LWTS3
                .           .           .
                .           .           .
   47          CPA.......................
                .
                .
   50           .        LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
1*****************************************                  *****************************************
 *                                       *                  *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                  *    U.S. ARMY CORPS OF ENGINEERS       *
 *              MAY   1991               *                  *    HYDROLOGIC ENGINEERING CENTER      *
 *            VERSION 4.0.1E             *                  *          609 SECOND STREET            *
 *                                       *                  *       DAVIS, CALIFORNIA 95616         *
```

```
*                                        *                                                                  *                                        *
*****************************************                                                                  *****************************************
```

LIQUID WASTE TREATMENT SYSTEM IN AREA 6 DATE:8SEPT94 FILE:2524LW3.DAT
1 MINUTE INTERVAL IN ITCARD
25-YEAR 24-HOUR STORM -- 2.0 INCHES
POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +7 (BEDROCK)
CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +10 (ALLUVIUM)
NEW SUBBASIN CONFIGURATION

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

   IT        HYDROGRAPH TIME DATA
                 NMIN          1  MINUTES IN COMPUTATION INTERVAL
                 IDATE     1   0  STARTING DATE
                 ITIME      0000  STARTING TIME
                    NQ       550  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE    1   0  ENDING DATE
                 NDTIME     0909  ENDING TIME
                 ICENT        19  CENTURY MARK

             COMPUTATION INTERVAL    0.02 HOURS
                  TOTAL TIME BASE    9.15 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

13 JD        INDEX STORM NO. 1
                 STRM        2.00  PRECIPITATION DEPTH
                 TRDA        0.01  TRANSPOSITION DRAINAGE AREA

14 PI          PRECIPITATION PATTERN
```

0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.46	0.46	0.46	0.46	0.46	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.12	0.12	0.12	0.12	0.12
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.16	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.20	0.20	0.20	0.20	0.20
0.24	0.24	0.24	0.24	0.24	0.30	0.30	0.30	0.30	0.30
0.36	0.36	0.36	0.36	0.36	0.42	0.42	0.42	0.42	0.42
0.52	0.52	0.52	0.52	0.52	2.08	2.08	2.08	2.08	2.08
5.52	5.52	5.52	5.52	5.52	0.88	0.88	0.88	0.88	0.88
0.56	0.56	0.56	0.56	0.56	0.46	0.46	0.46	0.46	0.46
0.36	0.36	0.36	0.36	0.36	0.30	0.30	0.30	0.30	0.30
0.26	0.26	0.26	0.26	0.26	0.22	0.22	0.22	0.22	0.22
0.20	0.20	0.20	0.20	0.20	0.18	0.18	0.18	0.18	0.18
0.16	0.16	0.16	0.16	0.16	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04					

24 JD INDEX STORM NO. 2

STRM 1.90 PRECIPITATION DEPTH
TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.46	0.46	0.46	0.46	0.46	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.12	0.12	0.12	0.12	0.12
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.16	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.20	0.20	0.20	0.20	0.20
0.24	0.24	0.24	0.24	0.24	0.30	0.30	0.30	0.30	0.30
0.36	0.36	0.36	0.36	0.36	0.42	0.42	0.42	0.42	0.42
0.52	0.52	0.52	0.52	0.52	2.08	2.08	2.08	2.08	2.08
5.52	5.52	5.52	5.52	5.52	0.88	0.88	0.88	0.88	0.88
0.56	0.56	0.56	0.56	0.56	0.46	0.46	0.46	0.46	0.46
0.36	0.36	0.36	0.36	0.36	0.30	0.30	0.30	0.30	0.30
0.26	0.26	0.26	0.26	0.26	0.22	0.22	0.22	0.22	0.22
0.20	0.20	0.20	0.20	0.20	0.18	0.18	0.18	0.18	0.18
0.16	0.16	0.16	0.16	0.16	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04					

25 JD INDEX STORM NO. 3

STRM 1.70 PRECIPITATION DEPTH
TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.46	0.46	0.46	0.46	0.46	0.08	0.08	0.08	0.08	0.08

0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.12	0.12	0.12	0.12	0.12
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.16	0.16	0.16	0.16	0.16
0.16	0.16	0.16	0.16	0.16	0.18	0.18	0.18	0.18	0.18
0.18	0.18	0.18	0.18	0.18	0.20	0.20	0.20	0.20	0.20
0.24	0.24	0.24	0.24	0.24	0.30	0.30	0.30	0.30	0.30
0.36	0.36	0.36	0.36	0.36	0.42	0.42	0.42	0.42	0.42
0.52	0.52	0.52	0.52	0.52	2.08	2.08	2.08	2.08	2.08
5.52	5.52	5.52	5.52	5.52	0.88	0.88	0.88	0.88	0.88
0.56	0.56	0.56	0.56	0.56	0.46	0.46	0.46	0.46	0.46
0.36	0.36	0.36	0.36	0.36	0.30	0.30	0.30	0.30	0.30
0.26	0.26	0.26	0.26	0.26	0.22	0.22	0.22	0.22	0.22
0.20	0.20	0.20	0.20	0.20	0.18	0.18	0.18	0.18	0.18
0.16	0.16	0.16	0.16	0.16	0.14	0.14	0.14	0.14	0.14
0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.12	0.12	0.12	0.12	0.12	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04					

1

RUNOFF SUMMARY

FLOW IN CUBIC FEET PER SECOND

[redacted]

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	LWTS1	586.	3.88	86.	56.	56.	0.61		
+	ROUTED TO	RTCPA1	580.	3.97	86.	56.	56.	0.61		
+	HYDROGRAPH AT	LWTS2	252.	3.65	17.	11.	11.	0.11		
+	ROUTED TO	RTCPA2	228.	3.73	17.	11.	11.	0.11		
+	HYDROGRAPH AT	LWTS3	410.	3.75	43.	28.	28.	0.47		
+	3 COMBINED AT	CPA	912.	3.80	142.	93.	93.	1.19		
+	HYDROGRAPH AT	LWTS4	198.	3.72	18.	12.	12.	0.20		

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

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

NEWS NOB ALLUVIAL FAN (Model Set 1)

Model Set 1: News Nob Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	28	28
10	128	154
25	313	236
100	313	351

MEAN = 1.313207
STANDARD DEVIATION = 0.775501
SKEW = -1.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 154
50-YEAR DISCHARGE = 295
100-YEAR DISCHARGE = 351
500-YEAR DISCHARGE = 460

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.7531+0.7371 LOG(Q)

MEAN OF Z = 1.721018
STANDARD DEVIATION = 0.571596
SKEW = -1.000000
TRANSFORMATION CONSTANT = 4.115505

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	5.6637 Q 0.7371	WIDTH (FT)
0.5	0.3	49	0.36153	0.59010	3427

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	5.6637 Q 0.7371	WIDTH (FT)
3.5	0.4	68	0.27901	0.48805	2835
4.5	0.6	238	0.03916	0.09503	552

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

CP-NORTH ALLUVIAL FAN

Model Set 2: CP-North Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	26	26
10	101	115
25	235	200
100	375	394

MEAN = 1.406643
STANDARD DEVIATION = 0.510922
SKEW = 0.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 115
50-YEAR DISCHARGE = 286
100-YEAR DISCHARGE = 394
500-YEAR DISCHARGE = 754

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.2402+LOG(Q)

MEAN OF Z = 1.646801
STANDARD DEVIATION = 0.510922
SKEW = 0.000000
TRANSFORMATION CONSTANT = 4.070431

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
0.5	0.3	49	0.29308	0.46970		2698

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
3.5	0.4	68	0.20373	0.36075		2072
4.5	0.6	238	0.02945	0.07987		459

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

NEWS NOB ALLUVIAL FAN (Model Set 2)

Model Set 2: News Nob Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	28	27
10	128	152
25	335	268
100	481	518

MEAN = 1.407080
STANDARD DEVIATION = 0.621388
SKEW = -0.3

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 152
50-YEAR DISCHARGE = 381
100-YEAR DISCHARGE = 518
500-YEAR DISCHARGE = 936

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.4383+0.9210 LOG(Q)

MEAN OF Z = 1.734257
STANDARD DEVIATION = 0.572311
SKEW = -0.300000
TRANSFORMATION CONSTANT = 4.259456

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	2.7435 Q 0.9210	WIDTH (FT)
0.5	0.3	49	0.34235	0.55320	3325

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	2.7435 Q 0.9210	WIDTH (FT)
3.5	0.4	68	0.25817	0.45237	2719
4.5	0.6	238	0.04949	0.13143	790

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

CP-NORTH ALLUVIAL FAN (Model Set 3)

Model Set 3: CP-North Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	26	26
10	101	115
25	235	200
100	375	394

MEAN = 1.406643
STANDARD DEVIATION = 0.510922
SKEW = 0.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 115
50-YEAR DISCHARGE = 286
100-YEAR DISCHARGE = 394
500-YEAR DISCHARGE = 754

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.2402+LOG(Q)

MEAN OF Z = 1.646801
STANDARD DEVIATION = 0.510922
SKEW = 0.000000
TRANSFORMATION CONSTANT = 4.070431

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
0.5	0.3	49	0.29308	0.46970		2698

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
3.5	0.4	68	0.20373	0.36075		2072
4.5	0.6	238	0.02945	0.07987		459

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

NEWS NOB ALLUVIAL FAN (Model Set 3)

Model Set 3: News Nob Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	28	27
10	131	154
25	359	291
100	591	632

MEAN = 1.437689
STANDARD DEVIATION = 0.586041
SKEW = 0.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 154
50-YEAR DISCHARGE = 438
100-YEAR DISCHARGE = 632
500-YEAR DISCHARGE = 1332

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.3160+LOG(Q)

MEAN OF Z = 1.753658
STANDARD DEVIATION = 0.586041
SKEW = 0.000000
TRANSFORMATION CONSTANT = 4.335862

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	2.0700 Q	1.0000	WIDTH (FT)
0.5	0.3	49	0.33728	0.54597		3341

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	2.0700 Q	1.0000	WIDTH (FT)
3.5	0.4	68	0.25396	0.44788		2741
4.5	0.6	238	0.05595	0.14980		917

MODEL SET 1

2YRLW3
10YRLW5
25YRLW6
100YRLW7

HEC-1 MODEL

2-Year, 6-Hour

2YRLW3

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  10/06/94  TIME  07:08:04   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
*****************************************
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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
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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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID    2-YEAR 6-HOUR STORM 0.7 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     0.7     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0

 22           JD     .60    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
 32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33           BA    0.11
 34           LS              88
```

```
          35          UD    0.10
                      *

          36          KK  RTCPA2
          37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          38          RM       4     .09      .2
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          39          KK   LWTS3
          40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          41          BA    0.47
          42          LS              77
          43          UD    0.20
                      *
                      * CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          44          KK     CPA
          45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          46          HC       3
                      *

          47          KK   LWTS4
          48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          49          BA    0.20
          50          LS              77
          51          UD    0.17
                      *
                      *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
                      *
          52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23       LWTS1
                 V
                 V
    28      RTCPA1
                 .
                 .
    31           .       LWTS2
                 .          V
                 .          V
    36           .      RTCPA2
                 .          .
                 .          .
    39           .          .       LWTS3
                 .          .          .
                 .          .          .
    44         CPA.......................
                 .
                 .
    47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*              MAY   1991                 *
*            VERSION 4.0.1E               *
*                                         *
*  RUN DATE  10/06/94  TIME  07:08:04     *
*                                         *
*****************************************

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


                        LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
                        1 MINUTE INTERVAL IN ITCARD
                         2-YEAR 6-HOUR STORM 0.7 INCHES
```

```
                    POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT         HYDROGRAPH TIME DATA
                     NMIN          1  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0729  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

12 JD         INDEX-STORM NO. 1
                    STRM       0.70  PRECIPITATION DEPTH
                    TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI           PRECIPITATION PATTERN
                 0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                 0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                 0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                 0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                 0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                 0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                 0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                 0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                 0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                 0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                 0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                 0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                 0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                 0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                 1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                 1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                 0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                 0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                 0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                 0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                 0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                 0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                 0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                 0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                 0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                 0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                 0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD         INDEX STORM NO. 2
                    STRM       0.68  PRECIPITATION DEPTH
                    TRDA       1.00  TRANSPOSITION DRAINAGE AREA

 0 PI           PRECIPITATION PATTERN
                 0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.60 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	26.	3.90	5.	4.	4.	0.61		
+	ROUTED TO	RTCPA1	26.	3.98	5.	4.	4.	0.61		
+	HYDROGRAPH AT	LWTS2	11.	3.57	1.	1.	1.	0.11		
+	ROUTED TO	RTCPA2	10.	3.65	1.	1.	1.	0.11		
+	HYDROGRAPH AT	LWTS3	1.	4.98	0.	0.	0.	0.47		
+	3 COMBINED AT	CPA	28.	3.92	6.	5.	5.	1.19		
+	HYDROGRAPH AT	LWTS4	1.	4.95	0.	0.	0.	0.20		

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

HEC-1 MODEL

10-Year, 6-Hour

10YRLW5

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  10/06/94  TIME  06:33:52   *
*                                       *
*****************************************
```

```
*************************************
*                                   *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW5.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   10-YEAR 6-HOUR STORM 1.1 INCHES
  4           ID   POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.1     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.07       1
 22           JD     .95    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
 32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33           BA    0.11
 34           LS              88
```

```
          35          UD    0.10
                      *

          36          KK  RTCPA2
          37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          38          RM    4     .09      .2
                      *
1                                          HEC-1 INPUT                                                    PAGE  2

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


          39          KK   LWTS3
          40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          41          BA    0.47
          42          LS              77
          43          UD    0.20
                      *
                      *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          44          KK     CPA
          45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          46          HC       3
                      *

          47          KK   LWTS4
          48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          49          BA    0.20
          50          LS              77
          51          UD    0.17
                      *
                      *  DISCHARGE FROM CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
                      *
          52          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23       LWTS1
                 V
                 V
    28      RTCPA1
                 .
                 .
    31           .       LWTS2
                 .           V
                 .           V
    36           .      RTCPA2
                 .           .
                 .           .
    39           .           .       LWTS3
                 .           .           .
                 .           .           .
    44         CPA.......................
                 .
                 .
    47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  10/06/94  TIME  06:33:52  *
*                                      *
****************************************
```

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

LIQUID WASTE TREATMENT SYSTEM IN AREA 6 DATE:23AUG94 FILE:10YRLW5.DAT
1 MINUTE INTERVAL IN ITCARD
10-YEAR 6-HOUR STORM 1.1 INCHES

```
                    POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL    0.02 HOURS
                    TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                      STRM       1.10  PRECIPITATION DEPTH
                      TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                 0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                 0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                 0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                 0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                 0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                 0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                 0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                 0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                 0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                 0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                 0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                 0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                 0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                 0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                 1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                 1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                 0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                 0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                 0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                 0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                 0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                 0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                 0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                 0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                 0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                 0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                 0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD          INDEX STORM NO. 2
                      STRM       1.07  PRECIPITATION DEPTH
                      TRDA       1.00  TRANSPOSITION DRAINAGE AREA

 0 PI            PRECIPITATION PATTERN
                 0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.95 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	101.	3.82	17.	14.	14.	0.61		
+	ROUTED TO	RTCPA1	100.	3.90	17.	14.	14.	0.61		
+	HYDROGRAPH AT	LWTS2	36.	3.55	4.	3.	3.	0.11		
+	ROUTED TO	RTCPA2	34.	3.63	4.	3.	3.	0.11		
+	HYDROGRAPH AT	LWTS3	17.	3.80	3.	3.	3.	0.47		
+	3 COMBINED AT	CPA	128.	3.87	23.	19.	19.	1.19		
+	HYDROGRAPH AT	LWTS4	8.	3.78	1.	1.	1.	0.20		

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

HEC-1 MODEL

25-Year, 6-Hour

25YRLW6

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  06:33:02   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW6.DAT
  2           ID    1 MINUTE INTERVAL IN ITCARD
  3           ID    25-YEAR 6-HOUR STORM 1.3 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.3     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.55       1
 22           JD    1.38    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE  FOR APEX OF FAN 1
              *
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
```

```
 32          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33          BA    0.11
 34          LS              88
 35          UD    0.10
             *

 36          KK  RTCPA2
 37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 38          RM       4     .09     0.2
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 39          KK   LWTS3
 40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 41          BA    0.47
 42          LS              77
 43          UD    0.20
             *
             *   CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 44          KK     CPA
 45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 46          HC       3
             *

 47          KK   LWTS4
 48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 49          BA    0.20
 50          LS              77
 51          UD    0.17
             *
             * DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
             *
 52          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  23       LWTS1
               V
               V
  28     - RTCPA1
               .
               .
  31           .       LWTS2
               .           V
               .           V
  36           .      RTCPA2
               .           .
               .           .
  39           .           .       LWTS3
               .           .           .
               .           .           .
  44         CPA.......................
               .
               .
  47           .       LWTS4

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  06:33:02   *
*                                       *
*****************************************
```

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

```
                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW6.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    25-YEAR 6-HOUR STORM 1.3 INCHES
                   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
                   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                   BASELINE -- CURVE NUMBERS NOT ADJUSTED
                   NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                     STRM       1.30  PRECIPITATION DEPTH
                     TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                 0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                 0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                 0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                 0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                 0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                 0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                 0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                 0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                 0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                 0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                 0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                 0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                 0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                 0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                 0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                 1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                 1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                 0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                 0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                 0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                 0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                 0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                 0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                 0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                 0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                 0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                 0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                 0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                 0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                 0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD          INDEX STORM NO. 2
                     STRM       1.55  PRECIPITATION DEPTH
                     TRDA       1.00  TRANSPOSITION DRAINAGE AREA
```

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

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	LWTS1	216.	3.80	36.	29.	29.	0.61		
+	ROUTED TO	RTCPA1	215.	3.88	36.	29.	29.	0.61		
+	HYDROGRAPH AT	LWTS2	62.	3.55	6.	5.	5.	0.11		
+	ROUTED TO	RTCPA2	59.	3.63	6.	5.	5.	0.11		
+	HYDROGRAPH AT	LWTS3	74.	3.68	11.	9.	9.	0.47		
+	3 COMBINED AT	CPA	313.	3.82	55.	44.	44.	1.19		
+	HYDROGRAPH AT	LWTS4	30.	3.65	4.	3.	3.	0.20		

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

HEC-1 MODEL

100-Year, 6-Hour

100YRLW7

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  05:46:34   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:23AUG94  FILE:100YRLWA.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   100-YEAR 6-HOUR STORM 1.6 INCHES
  4           ID   POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
  8           ID   CURVE NUMBERS FOR ALLUVIUM DOMINANT WATERSHEDS (LWTS3 AND LWTS4) ADJUSTED +10
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     450
 11           IO       5
 12           IN       5
 13           JD     1.6     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 21           PC    99.8    99.9   100.0
 22           JD    1.55       1
 23           JD    1.38    9.99
              *

 24           KK   LWTS1
 25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE FOR APEX OF FAN 1
              *
 26           BA    0.61
              * CURVE NUMBER ADJUSTED +7
 27           LS              94
 28           UD    0.34
              *

 29           KK  RTCPA1
 30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 31           RM       4     .08      .2
              *
```

```
          32          KK   LWTS2
          33          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
          34          BA    0.11
                      * CURVE NUMBER ADJUSTED +7
          35          LS              95
          36          UD    0.10
                      *
1                                                HEC-1 INPUT                                                    PAGE  2

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


          37          KK  RTCPA2
          38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          39          RM       4     .09     0.2
                      *

          40          KK   LWTS3
          41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          42          BA    0.47
                      * CURVE NUMBER ADJUSTED +10
          43          LS              87
          44          UD    0.20
                      *
                      *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          45          KK     CPA
          46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          47          HC       3
                      *

          48          KK   LTWS4
          49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          50          BA    0.20
                      * CURVE NUMBER ADJUSTED +10
          51          LS              87
          52          UD    0.17
                      *
                      *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
                      *
          53          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24       LWTS1
                 V
                 V
    29      RTCPA1
                 .
                 .
    32           .       LWTS2
                 .           V
                 .           V
    37           .      RTCPA2
                 .           .
                 .           .
    40           .           .       LWTS3
                 .           .           .
                 .           .           .
    45         CPA.......................
                 .
                 .
    48           .       LTWS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *            VERSION 4.0.1E             *
 *                                       *
 *  RUN DATE  10/06/94  TIME  05:46:34   *
 *                                       *
 *****************************************

                                                  ****************************************
                                                  *                                      *
                                                  *    U.S. ARMY CORPS OF ENGINEERS      *
                                                  *    HYDROLOGIC ENGINEERING CENTER     *
                                                  *          609 SECOND STREET           *
                                                  *       DAVIS, CALIFORNIA 95616        *
                                                  *           (916) 551-1748             *
                                                  *                                      *
                                                  ****************************************
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                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:23AUG94  FILE:100YRLWA.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    100-YEAR 6-HOUR STORM 1.6 INCHES
                    POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
                    CURVE NUMBERS FOR ALLUVIUM DOMINANT WATERSHEDS (LWTS3 AND LWTS4) ADJUSTED +10
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE     1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ         450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     1    0  ENDING DATE
                    NDTIME        0729  ENDING TIME
                     ICENT          19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

13 JD          INDEX STORM NO. 1
                     STRM        1.60  PRECIPITATION DEPTH
                     TRDA        0.01  TRANSPOSITION DRAINAGE AREA

14 PI            PRECIPITATION PATTERN
                 0.40    0.40    0.40    0.40    0.40    0.74    0.74    0.74    0.74    0.74
                 0.26    0.26    0.26    0.26    0.26    0.34    0.34    0.34    0.34    0.34
                 0.42    0.42    0.42    0.42    0.42    0.32    0.32    0.32    0.32    0.32
                 0.12    0.12    0.12    0.12    0.12    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.06    0.06    0.06    0.06    0.06    0.14    0.14    0.14    0.14    0.14
                 0.04    0.04    0.04    0.04    0.04    0.12    0.12    0.12    0.12    0.12
                 0.20    0.20    0.20    0.20    0.20    0.28    0.28    0.28    0.28    0.28
                 0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18
                 0.14    0.14    0.14    0.14    0.14    0.04    0.04    0.04    0.04    0.04
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.20    0.20    0.20    0.20    0.20
                 0.30    0.30    0.30    0.30    0.30    0.24    0.24    0.24    0.24    0.24
                 0.16    0.16    0.16    0.16    0.16    0.04    0.04    0.04    0.04    0.04
                 0.10    0.10    0.10    0.10    0.10    0.28    0.28    0.28    0.28    0.28
                 0.16    0.16    0.16    0.16    0.16    0.06    0.06    0.06    0.06    0.06
                 0.04    0.04    0.04    0.04    0.04    0.24    0.24    0.24    0.24    0.24
                 0.54    0.54    0.54    0.54    0.54    0.60    0.60    0.60    0.60    0.60
                 1.14    1.14    1.14    1.14    1.14    1.80    1.80    1.80    1.80    1.80
                 1.82    1.82    1.82    1.82    1.82    2.40    2.40    2.40    2.40    2.40
                 0.68    0.68    0.68    0.68    0.68    0.74    0.74    0.74    0.74    0.74
                 0.62    0.62    0.62    0.62    0.62    0.14    0.14    0.14    0.14    0.14
                 0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32
                 0.10    0.10    0.10    0.10    0.10    0.08    0.08    0.08    0.08    0.08
                 0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16
                 0.24    0.24    0.24    0.24    0.24    0.44    0.44    0.44    0.44    0.44
                 0.32    0.32    0.32    0.32    0.32    0.22    0.22    0.22    0.22    0.22
                 0.26    0.26    0.26    0.26    0.26    0.40    0.40    0.40    0.40    0.40
                 0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12
                 0.06    0.06    0.06    0.06    0.06    0.04    0.04    0.04    0.04    0.04
                 0.04    0.04    0.04    0.04    0.04    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
```

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 2

STRM 1.55 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04

0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	375.	3.77	65.	52.	52.	0.61		
+	ROUTED TO	RTCPA1	372.	3.85	65.	52.	52.	0.61		
+	HYDROGRAPH AT	LWTS2	114.	3.55	13.	10.	10.	0.11		
+	ROUTED TO	RTCPA2	109.	3.62	13.	10.	10.	0.11		
+	HYDROGRAPH AT	LWTS3	223.	3.63	29.	23.	23.	0.47		
+	3 COMBINED AT	CPA	591.	3.70	104.	84.	84.	1.19		
+	HYDROGRAPH AT	LTWS4	103.	3.60	13.	10.	10.	0.20		

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

MODEL SET 2

2YRLW3
10YRLW5
25YRLW7
100YRLW9

HEC-1 MODEL

2-Year, 6-Hour

2YRLW3

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1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *   U.S. ARMY CORPS OF ENGINEERS        *
*              MAY   1991                 *                    *   HYDROLOGIC ENGINEERING CENTER       *
*            VERSION 4.0.1E               *                    *         609 SECOND STREET             *
*                                         *                    *      DAVIS, CALIFORNIA 95616          *
*  RUN DATE  10/06/94  TIME  07:08:04     *                    *          (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

1                                                HEC-1 INPUT                                                PAGE  1

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

        1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
        2           ID   1 MINUTE INTERVAL IN ITCARD
        3           ID    2-YEAR 6-HOUR STORM 0.7 INCHES
        4           ID   POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
        5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
        6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
        7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
        8           ID   NEW SUBBASIN CONFIGURATION
                    *DIAGRAM
        9           IT       1       0       0     450
       10           IO       5
       11           IN       5
       12           JD     0.7     .01
                    * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
       13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
       14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
       15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
       16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
       17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
       18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
       19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
       20           PC    99.8    99.9   100.0
       21           JD     .68       1
       22           JD     .60    9.99
                    *

       23           KK   LWTS1
       24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
       25           BA    0.61
       26           LS              87
       27           UD    0.34
                    *

       28           KK  RTCPA1
       29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
       30           RM       4     .08      .2
                    *

       31           KK   LWTS2
       32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
       33           BA    0.11
       34           LS              88
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```
 35          UD    0.10
             *

 36          KK  RTCPA2
 37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 38          RM       4     .09      .2
             *
1                                          HEC-1 INPUT                                                PAGE  2

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


 39          KK   LWTS3
 40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 41          BA    0.47
 42          LS              77
 43          UD    0.20
             *
             * CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 44          KK     CPA
 45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 46          HC       3
             *

 47          KK   LWTS4
 48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 49          BA    0.20
 50          LS              77
 51          UD    0.17
             *
             *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
             *
 52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   23        LWTS1
                V
                V
   28       RTCPA1
                .
                .
   31           .        LWTS2
                .           V
                .           V
   36           .       RTCPA2
                .           .
                .           .
   39           .           .       LWTS3
                .           .           .
                .           .           .
   44         CPA.......................
                .
                .
   47           .        LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                                  ****************************************
*                                         *                                  *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                                  *    U.S. ARMY CORPS OF ENGINEERS      *
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```
                    POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                     STRM       0.70  PRECIPITATION DEPTH
                     TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                  0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                  0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                  0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                  0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                  0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                  0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                  0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                  0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                  0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                  0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                  0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                  0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                  0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                  1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                  1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                  0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                  0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                  0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                  0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                  0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                  0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                  0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                  0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                  0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                  0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                  0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD          INDEX STORM NO. 2
                     STRM       0.68  PRECIPITATION DEPTH
                     TRDA       1.00  TRANSPOSITION DRAINAGE AREA

 0 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.60 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	26.	3.90	5.	4.	4.	0.61		
+	ROUTED TO	RTCPA1	26.	3.98	5.	4.	4.	0.61		
+	HYDROGRAPH AT	LWTS2	11.	3.57	1.	1.	1.	0.11		
+	ROUTED TO	RTCPA2	10.	3.65	1.	1.	1.	0.11		
+	HYDROGRAPH AT	LWTS3	1.	4.98	0.	0.	0.	0.47		
+	3 COMBINED AT	CPA	28.	3.92	6.	5.	5.	1.19		
+	HYDROGRAPH AT	LWTS4	1.	4.95	0.	0.	0.	0.20		

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

HEC-1 MODEL

10-Year, 6-Hour

10YRLW5

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  06:33:52   *
*                                       *
*****************************************
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```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW5.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   10-YEAR 6-HOUR STORM 1.1 INCHES
  4           ID   POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.1     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.07       1
 22           JD     .95    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
 32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33           BA    0.11
 34           LS              88
```

HEC-1 MODEL

25-Year, 6-Hour

25YRLW7

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  05:49:49   *
*                                       *
*****************************************
```

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*****************************************
*                                       *
*    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    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW7.DAT
  2           ID    1 MINUTE INTERVAL IN ITCARD
  3           ID    25-YEAR 6-HOUR STORM 1.3 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.3     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.55       1
 22           JD    1.38    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE  FOR APEX OF FAN 1
              *
 25           BA    0.61
              * CURVE NUMBER ADJUSTED +1
 26           LS              88
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *
```

```
          31          KK   LWTS2
          32          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
          33          BA    0.11
                      * CURVE NUMBER ADJUSTED +1
          34          LS              89
          35          UD    0.10
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          36          KK  RTCPA2
          37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          38          RM       4     .09     0.2
                      *

          39          KK   LWTS3
          40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          41          BA    0.47
          42          LS              77
          43          UD    0.20
                      *
                      *   CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          44          KK     CPA
          45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          46          HC       3
                      *

          47          KK   LWTS4
          48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          49          BA    0.20
          50          LS              77
          51          UD    0.17
                      *
                      * DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
                      *
          52          ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23       LWTS1
                 V
                 V
    28      RTCPA1
                 .
                 .
    31           .       LWTS2
                 .           V
                 .           V
    36           .      RTCPA2
                 .           .
                 .           .
    39           .           .       LWTS3
                 .           .           .
                 .           .           .
    44         CPA.......................
                 .
                 .
    47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*              MAY   1991                 *
*            VERSION 4.0.1E               *
*                                         *
*  RUN DATE  10/06/94  TIME  05:49:49     *
*                                         *
*****************************************

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

```
                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW7.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    25-YEAR 6-HOUR STORM 1.3 INCHES
                   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
                   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
                   NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1   0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL    0.02 HOURS
                    TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                      STRM       1.30  PRECIPITATION DEPTH
                      TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                 0.40   0.40   0.40   0.40   0.40   0.74   0.74   0.74   0.74   0.74
                 0.26   0.26   0.26   0.26   0.26   0.34   0.34   0.34   0.34   0.34
                 0.42   0.42   0.42   0.42   0.42   0.32   0.32   0.32   0.32   0.32
                 0.12   0.12   0.12   0.12   0.12   0.00   0.00   0.00   0.00   0.00
                 0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
                 0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
                 0.06   0.06   0.06   0.06   0.06   0.14   0.14   0.14   0.14   0.14
                 0.04   0.04   0.04   0.04   0.04   0.12   0.12   0.12   0.12   0.12
                 0.20   0.20   0.20   0.20   0.20   0.28   0.28   0.28   0.28   0.28
                 0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18   0.18
                 0.14   0.14   0.14   0.14   0.14   0.04   0.04   0.04   0.04   0.04
                 0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.20   0.20   0.20   0.20   0.20
                 0.30   0.30   0.30   0.30   0.30   0.24   0.24   0.24   0.24   0.24
                 0.16   0.16   0.16   0.16   0.16   0.04   0.04   0.04   0.04   0.04
                 0.10   0.10   0.10   0.10   0.10   0.28   0.28   0.28   0.28   0.28
                 0.16   0.16   0.16   0.16   0.16   0.06   0.06   0.06   0.06   0.06
                 0.04   0.04   0.04   0.04   0.04   0.24   0.24   0.24   0.24   0.24
                 0.54   0.54   0.54   0.54   0.54   0.60   0.60   0.60   0.60   0.60
                 1.14   1.14   1.14   1.14   1.14   1.80   1.80   1.80   1.80   1.80
                 1.82   1.82   1.82   1.82   1.82   2.40   2.40   2.40   2.40   2.40
                 0.68   0.68   0.68   0.68   0.68   0.74   0.74   0.74   0.74   0.74
                 0.62   0.62   0.62   0.62   0.62   0.14   0.14   0.14   0.14   0.14
                 0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32   0.32
                 0.10   0.10   0.10   0.10   0.10   0.08   0.08   0.08   0.08   0.08
                 0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16   0.16
                 0.24   0.24   0.24   0.24   0.24   0.44   0.44   0.44   0.44   0.44
                 0.32   0.32   0.32   0.32   0.32   0.22   0.22   0.22   0.22   0.22
                 0.26   0.26   0.26   0.26   0.26   0.40   0.40   0.40   0.40   0.40
                 0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12   0.12
                 0.06   0.06   0.06   0.06   0.06   0.04   0.04   0.04   0.04   0.04
                 0.04   0.04   0.04   0.04   0.04   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.00   0.00   0.00   0.00   0.00
                 0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02
                 0.06   0.06   0.06   0.06   0.06   0.00   0.00   0.00   0.00   0.00
                 0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02   0.02

21 JD          INDEX STORM NO. 2
                      STRM       1.55  PRECIPITATION DEPTH
```

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00

0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02

1

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	LWTS1	235.	3.78	39.	32.	32.	0.61		
+	ROUTED TO	RTCPA1	233.	3.87	39.	32.	32.	0.61		
+	HYDROGRAPH AT	LWTS2	67.	3.55	7.	6.	6.	0.11		
+	ROUTED TO	RTCPA2	64.	3.63	7.	6.	6.	0.11		
+	HYDROGRAPH AT	LWTS3	74.	3.68	11.	9.	9.	0.47		
+	3 COMBINED AT	CPA	335.	3.82	59.	47.	47.	1.19		
+	HYDROGRAPH AT	LWTS4	30.	3.65	4.	3.	3.	0.20		

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

HEC-1 MODEL

100-Year, 6-Hour

100YRLW9

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1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.0.1E               *                    *          609 SECOND STREET            *
*                                         *                    *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE  10/06/94  TIME  05:47:14     *                    *           (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

1                                                HEC-1 INPUT                                                PAGE  1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:26AUG94  FILE:100YRLW9.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   100-YEAR 6-HOUR STORM 1.6 INCHES
  4           ID   POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.6     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.55       1
 22           JD    1.38    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE FOR APEX OF FAN 1
              *
 25           BA    0.61
              * CURVE NUMBER ADJUSTED +7
 26           LS              94
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *
```

```
          31          KK   LWTS2
          32          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
          33          BA    0.11
                      * CURVE NUMBER ADJUSTED +7
          34          LS              95
          35          UD    0.10
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          36          KK  RTCPA2
          37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          38          RM       4     .09     0.2
                      *

          39          KK   LWTS3
          40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          41          BA    0.47
          42          LS              77
          43          UD    0.20
                      *
                      *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          44          KK     CPA
          45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          46          HC       3
                      *

          47          KK   LTWS4
          48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          49          BA    0.20
          50          LS              77
          51          UD    0.17
                      *
                      *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
                      *
          52          ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23       LWTS1
                 V
                 V
    28      RTCPA1
                 .
                 .
    31           .       LWTS2
                 .           V
                 .           V
    36           .      RTCPA2
                 .           .
                 .           .
    39           .           .       LWTS3
                 .           .           .
                 .           .           .
    44         CPA.......................
                 .
                 .
    47           .       LTWS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*              MAY   1991                 *
*            VERSION 4.0.1E               *
*                                         *
*  RUN DATE  10/06/94  TIME  05:47:14     *
*                                         *
*****************************************

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

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                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:26AUG94  FILE:100YRLW8.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    100-YEAR 6-HOUR STORM 1.6 INCHES
                    POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    CURVE NUMBERS FOR APEX 1 (LWTS1) AND LWTS2 (BEDROCK RATIONALE) ADJUSTED +7
                    NEW SUBBASIN CONFIGURATION

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

    IT          HYDROGRAPH TIME DATA
                       NMIN          1  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1   0  ENDING DATE
                     NDTIME       0729  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL    0.02 HOURS
                      TOTAL TIME BASE    7.48 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

 12 JD          INDEX STORM NO. 1
                       STRM       1.60  PRECIPITATION DEPTH
                       TRDA       0.01  TRANSPOSITION DRAINAGE AREA

 13 PI            PRECIPITATION PATTERN
                    0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                    0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                    0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                    0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                    0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                    0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                    0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                    0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                    0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                    0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                    0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                    0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                    0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                    0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                    0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                    0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                    1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                    1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                    0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                    0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                    0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                    0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                    0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                    0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                    0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                    0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                    0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                    0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                    0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                    0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                    0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                    0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                    0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

 21 JD          INDEX STORM NO. 2
                       STRM       1.55  PRECIPITATION DEPTH
```

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00

0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02

1

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	LWTS1	375.	3.77	65.	52.	52.	0.61		
+	ROUTED TO	RTCPA1	372.	3.85	65.	52.	52.	0.61		
+	HYDROGRAPH AT	LWTS2	114.	3.55	13.	10.	10.	0.11		
+	ROUTED TO	RTCPA2	109.	3.62	13.	10.	10.	0.11		
+	HYDROGRAPH AT	LWTS3	81.	3.68	12.	9.	9.	0.47		
+	3 COMBINED AT	CPA	481.	3.80	87.	70.	70.	1.19		
+	HYDROGRAPH AT	LTWS4	38.	3.63	5.	4.	4.	0.20		

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

MODEL SET 3

2YRLW3
10YRLW6
25YRLW8
100YRLWA

HEC-1 MODEL

2-Year, 6-Hour

2YRLW3

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  07:08:04   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
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```
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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6  DATE:23AUG94  FILE: 2YRLW3.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID    2-YEAR 6-HOUR STORM 0.7 INCHES
  4           ID   POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
  7           ID   BASELINE -- CURVE NUMBERS NOT ADJUSTED
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     0.7     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD     .68       1
 22           JD     .60    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 25           BA    0.61
 26           LS              87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
 32           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33           BA    0.11
 34           LS              88
```

```
 35          UD    0.10
             *

 36          KK  RTCPA2
 37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 38          RM       4     .09      .2
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 39          KK   LWTS3
 40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 41          BA    0.47
 42          LS              77
 43          UD    0.20
             *
             * CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 44          KK     CPA
 45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 46          HC       3
             *

 47          KK   LWTS4
 48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 49          BA    0.20
 50          LS              77
 51          UD    0.17
             *
             * DISCHARGE FOR CONCENTRATION POINT A (CPA) IS THE DISCHARGE FROM LWTS3

 52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   23        LWTS1
                V
                V
   28       RTCPA1
                .
                .
   31           .       LWTS2
                .           V
                .           V
   36           .      RTCPA2
                .           .
                .           .
   39           .           .       LWTS3
                .           .           .
                .           .           .
   44         CPA.......................
                .
                .
   47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.0.1E               *                    *          609 SECOND STREET            *
*                                         *                    *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE  10/06/94  TIME  07:08:04     *                    *          (916) 551-1748               *
*                                         *                    *                                       *
*****************************************                    *****************************************
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                    POINT RAINFALL FROM NOAA ATLAS 2 VOL VII (NO ADJUSTMENT NECESSARY)
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT         HYDROGRAPH TIME DATA
                     NMIN          1  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0729  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

12 JD         INDEX STORM NO. 1
                    STRM       0.70  PRECIPITATION DEPTH
                    TRDA       0.01  TRANSPOSITION DRAINAGE AREA

13 PI           PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                  0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                  0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                  0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                  0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                  0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                  0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                  0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                  0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                  0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                  0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                  0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                  0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                  0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                  1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                  1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                  0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                  0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                  0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                  0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                  0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                  0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                  0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                  0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                  0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                  0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                  0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD         INDEX STORM NO. 2
                    STRM       0.68  PRECIPITATION DEPTH
                    TRDA       1.00  TRANSPOSITION DRAINAGE AREA

 0 PI           PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.60 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	26.	3.90	5.	4.	4.	0.61		
+	ROUTED TO	RTCPA1	26.	3.98	5.	4.	4.	0.61		
+	HYDROGRAPH AT	LWTS2	11.	3.57	1.	1.	1.	0.11		
+	ROUTED TO	RTCPA2	10.	3.65	1.	1.	1.	0.11		
+	HYDROGRAPH AT	LWTS3	1.	4.98	0.	0.	0.	0.47		
+	3 COMBINED AT	CPA	28.	3.92	6.	5.	5.	1.19		
+	HYDROGRAPH AT	LWTS4	1.	4.95	0.	0.	0.	0.20		

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

HEC-1 MODEL

10-Year, 6-Hour

10YRLW6

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  05:50:45   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
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```
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
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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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW6.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   10-YEAR 6-HOUR STORM 1.1 INCHES
  4           ID   POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   BASELINE -- BEDROCK CURVE NUMBERS NOT ADJUSTED
  8           ID   ALLUVIUM CURVE NUMBERS (LWTS3 AND LWTS4) ADJUSTED +1
  9           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
 10           IT       1       0       0     450
 11           IO       5
 12           IN       5
 13           JD     1.1     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
 15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 21           PC    99.8    99.9   100.0
 22           JD    1.07       1
 23           JD     .95    9.99
              *

 24           KK   LWTS1
 25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
 26           BA    0.61
 27           LS              87
 28           UD    0.34
              *

 29           KK  RTCPA1
 30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 31           RM       4     .08      .2
              *

 32           KK   LWTS2
 33           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 34           BA    0.11
```

```
 35          LS              88
 36          UD    0.10
             *

 37          KK  RTCPA2
 38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 39          RM       4     .09      .2
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 40          KK   LWTS3
 41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 42          BA    0.47
             * ADJUST CURVE NUMBER +1
 43          LS              78
 44          UD    0.20
             *
             *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 45          KK     CPA
 46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 47          HC       3
             *

 48          KK   LWTS4
 49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
 50          BA    0.20
             * ADJUST CURVE NUMBER +1
 51          LS              78
 52          UD    0.17
             *
             *  DISCHARGE FROM CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
             *
 53          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   24       LWTS1
                V
                V
   29      RTCPA1
                .
                .
   32           .       LWTS2
                .           V
                .           V
   37           .      RTCPA2
                .           .
                .           .
   40           .           .       LWTS3
                .           .           .
                .           .           .
   45         CPA.......................
                .
                .
   48           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *           VERSION 4.0.1E              *
 *                                       *
 *  RUN DATE  10/06/94  TIME  05:50:45   *
 *                                       *
 *****************************************

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

```
                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6   DATE:23AUG94   FILE:10YRLW6.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    10-YEAR 6-HOUR STORM 1.1 INCHES
                    POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    BASELINE -- BEDROCK CURVE NUMBERS NOT ADJUSTED
                    ALLUVIUM CURVE NUMBERS (LWTS3 AND LWTS4) ADJUSTED +1
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                      NMIN          1  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      1    0  ENDING DATE
                    NDTIME       0729  ENDING TIME
                     ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL    0.02 HOURS
                     TOTAL TIME BASE    7.48 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

13 JD          INDEX STORM NO. 1
                      STRM       1.10  PRECIPITATION DEPTH
                      TRDA       0.01  TRANSPOSITION DRAINAGE AREA

14 PI            PRECIPITATION PATTERN
                 0.40    0.40    0.40    0.40    0.40    0.74    0.74    0.74    0.74    0.74
                 0.26    0.26    0.26    0.26    0.26    0.34    0.34    0.34    0.34    0.34
                 0.42    0.42    0.42    0.42    0.42    0.32    0.32    0.32    0.32    0.32
                 0.12    0.12    0.12    0.12    0.12    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.06    0.06    0.06    0.06    0.06    0.14    0.14    0.14    0.14    0.14
                 0.04    0.04    0.04    0.04    0.04    0.12    0.12    0.12    0.12    0.12
                 0.20    0.20    0.20    0.20    0.20    0.28    0.28    0.28    0.28    0.28
                 0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18
                 0.14    0.14    0.14    0.14    0.14    0.04    0.04    0.04    0.04    0.04
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.20    0.20    0.20    0.20    0.20
                 0.30    0.30    0.30    0.30    0.30    0.24    0.24    0.24    0.24    0.24
                 0.16    0.16    0.16    0.16    0.16    0.04    0.04    0.04    0.04    0.04
                 0.10    0.10    0.10    0.10    0.10    0.28    0.28    0.28    0.28    0.28
                 0.16    0.16    0.16    0.16    0.16    0.06    0.06    0.06    0.06    0.06
                 0.04    0.04    0.04    0.04    0.04    0.24    0.24    0.24    0.24    0.24
                 0.54    0.54    0.54    0.54    0.54    0.60    0.60    0.60    0.60    0.60
                 1.14    1.14    1.14    1.14    1.14    1.80    1.80    1.80    1.80    1.80
                 1.82    1.82    1.82    1.82    1.82    2.40    2.40    2.40    2.40    2.40
                 0.68    0.68    0.68    0.68    0.68    0.74    0.74    0.74    0.74    0.74
                 0.62    0.62    0.62    0.62    0.62    0.14    0.14    0.14    0.14    0.14
                 0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32
                 0.10    0.10    0.10    0.10    0.10    0.08    0.08    0.08    0.08    0.08
                 0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16
                 0.24    0.24    0.24    0.24    0.24    0.44    0.44    0.44    0.44    0.44
                 0.32    0.32    0.32    0.32    0.32    0.22    0.22    0.22    0.22    0.22
                 0.26    0.26    0.26    0.26    0.26    0.40    0.40    0.40    0.40    0.40
                 0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12
                 0.06    0.06    0.06    0.06    0.06    0.04    0.04    0.04    0.04    0.04
                 0.04    0.04    0.04    0.04    0.04    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02

22 JD          INDEX STORM NO. 2
                      STRM       1.07  PRECIPITATION DEPTH
```

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 0.95 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00

0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02

1

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	LWTS1	101.	3.82	17.	14.	14.	0.61		
+	ROUTED TO	RTCPA1	100.	3.90	17.	14.	14.	0.61		
+	HYDROGRAPH AT	LWTS2	36.	3.55	4.	3.	3.	0.11		
+	ROUTED TO	RTCPA2	34.	3.63	4.	3.	3.	0.11		
+	HYDROGRAPH AT	LWTS3	22.	3.77	4.	3.	3.	0.47		
+	3 COMBINED AT	CPA	131.	3.85	24.	19.	19.	1.19		
+	HYDROGRAPH AT	LWTS4	10.	3.72	2.	1.	1.	0.20		

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

HEC-1 MODEL

25-Year, 6-Hour

25YRLW8

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1*****************************************                    *****************************************
*                                         *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS       *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER      *
*           VERSION 4.0.1E                *                    *          609 SECOND STREET            *
*                                         *                    *       DAVIS, CALIFORNIA 95616         *
*  RUN DATE  10/06/94  TIME  05:48:42     *                    *          (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

1                                                HEC-1 INPUT                                                PAGE  1

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

        1           ID    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW8.DAT
        2           ID    1 MINUTE INTERVAL IN ITCARD
        3           ID    25-YEAR 6-HOUR STORM 1.3 INCHES
        4           ID   POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)
        5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
        6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
        7           ID   CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
        8           ID   CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +3 (ALLUVIUM)
        9           ID   NEW SUBBASIN CONFIGURATION
                    *DIAGRAM
       10           IT       1       0       0     450
       11           IO       5
       12           IN       5
       13           JD     1.3     .01
                    * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
       14           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0    13.0
       15           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
       16           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
       17           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
       18           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
       19           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
       20           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
       21           PC    99.8    99.9   100.0
       22           JD    1.55       1
       23           JD    1.38    9.99
                    *

       24           KK   LWTS1
       25           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
                    *
                    * DISCHARGE  FOR APEX OF FAN 1
                    *
       26           BA    0.61
                    * CURVE NUMBER ADJUSTED +1
       27           LS              88
       28           UD    0.34
                    *

       29           KK  RTCPA1
       30           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
       31           RM       4     .08      .2
                    *
```

```
          32          KK   LWTS2
          33          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
          34          BA    0.11
                      * CURVE NUMBER ADJUSTED +1
          35          LS              89
          36          UD    0.10
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          37          KK  RTCPA2
          38          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          39          RM       4     .09     0.2
                      *

          40          KK   LWTS3
          41          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          42          BA    0.47
                      * CURVE NUMBER ADJUSTED +3
          43          LS              80
          44          UD    0.20
                      *
                      *   CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          45          KK     CPA
          46          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          47          HC       3
                      *

          48          KK   LWTS4
          49          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          50          BA    0.20
                      * CURVE NUMBER ADJUSTED +3
          51          LS              80
          52          UD    0.17
                      *
                      * DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
                      *
          53          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    24       LWTS1
                 V
                 V
    29      RTCPA1
                 .
                 .
    32           .       LWTS2
                 .           V
                 .           V
    37           .      RTCPA2
                 .           .
                 .           .
    40           .           .       LWTS3
                 .           .           .
                 .           .           .
    45         CPA.......................
                 .
                 .
    48           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              MAY   1991              *
 *            VERSION 4.0.1E            *
 *                                      *
 *  RUN DATE  10/06/94  TIME  05:48:42  *
 *                                      *
 ****************************************

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

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                    LIQUID WASTE TREATMENT SYSTEM IN AREA 6     DATE:23AUG94  FILE:25YRLW8.DAT
                    1 MINUTE INTERVAL IN ITCARD
                    25-YEAR 6-HOUR STORM 1.3 INCHES
                    POINT RAINFALL FROM NOAA ATLAS II VOL 7 (NO ADJUSTMENT NECESSARY)

                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCFRCD, 1990)
                    CURVE NUMBERS FOR LWTS1 AND LWTS2 ADJUSTED +1 (BEDROCK)
                    CURVE NUMBERS FOR LWTS3 AND LWTS4 ADJUSTED +3 (ALLUVIUM)
                    NEW SUBBASIN CONFIGURATION

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

   IT         HYDROGRAPH TIME DATA
                     NMIN          1  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0729  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

13 JD         INDEX STORM NO. 1
                    STRM       1.30  PRECIPITATION DEPTH
                    TRDA       0.01  TRANSPOSITION DRAINAGE AREA

14 PI           PRECIPITATION PATTERN
                 0.40    0.40    0.40    0.40    0.40    0.74    0.74    0.74    0.74    0.74
                 0.26    0.26    0.26    0.26    0.26    0.34    0.34    0.34    0.34    0.34
                 0.42    0.42    0.42    0.42    0.42    0.32    0.32    0.32    0.32    0.32
                 0.12    0.12    0.12    0.12    0.12    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                 0.06    0.06    0.06    0.06    0.06    0.14    0.14    0.14    0.14    0.14
                 0.04    0.04    0.04    0.04    0.04    0.12    0.12    0.12    0.12    0.12
                 0.20    0.20    0.20    0.20    0.20    0.28    0.28    0.28    0.28    0.28
                 0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18    0.18
                 0.14    0.14    0.14    0.14    0.14    0.04    0.04    0.04    0.04    0.04
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.20    0.20    0.20    0.20    0.20
                 0.30    0.30    0.30    0.30    0.30    0.24    0.24    0.24    0.24    0.24
                 0.16    0.16    0.16    0.16    0.16    0.04    0.04    0.04    0.04    0.04
                 0.10    0.10    0.10    0.10    0.10    0.28    0.28    0.28    0.28    0.28
                 0.16    0.16    0.16    0.16    0.16    0.06    0.06    0.06    0.06    0.06
                 0.04    0.04    0.04    0.04    0.04    0.24    0.24    0.24    0.24    0.24
                 0.54    0.54    0.54    0.54    0.54    0.60    0.60    0.60    0.60    0.60
                 1.14    1.14    1.14    1.14    1.14    1.80    1.80    1.80    1.80    1.80
                 1.82    1.82    1.82    1.82    1.82    2.40    2.40    2.40    2.40    2.40
                 0.68    0.68    0.68    0.68    0.68    0.74    0.74    0.74    0.74    0.74
                 0.62    0.62    0.62    0.62    0.62    0.14    0.14    0.14    0.14    0.14
                 0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32    0.32
                 0.10    0.10    0.10    0.10    0.10    0.08    0.08    0.08    0.08    0.08
                 0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16    0.16
                 0.24    0.24    0.24    0.24    0.24    0.44    0.44    0.44    0.44    0.44
                 0.32    0.32    0.32    0.32    0.32    0.22    0.22    0.22    0.22    0.22
                 0.26    0.26    0.26    0.26    0.26    0.40    0.40    0.40    0.40    0.40
                 0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12    0.12
                 0.06    0.06    0.06    0.06    0.06    0.04    0.04    0.04    0.04    0.04
                 0.04    0.04    0.04    0.04    0.04    0.02    0.02    0.02    0.02    0.02
                 0.06    0.06    0.06    0.06    0.06    0.00    0.00    0.00    0.00    0.00
                 0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02
```

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 2

STRM 1.55 PRECIPITATION DEPTH

TRDA 1.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

23 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12

0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	235.	3.78	39.	32.	32.	0.61		
+	ROUTED TO	RTCPA1	233.	3.87	39.	32.	32.	0.61		
+	HYDROGRAPH AT	LWTS2	67.	3.55	7.	6.	6.	0.11		
+	ROUTED TO	RTCPA2	64.	3.63	7.	6.	6.	0.11		
+	HYDROGRAPH AT	LWTS3	107.	3.67	15.	12.	12.	0.47		
+	3 COMBINED AT	CPA	359.	3.78	63.	51.	51.	1.19		
+	HYDROGRAPH AT	LWTS4	45.	3.63	6.	5.	5.	0.20		

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

HEC-1 MODEL

100-Year, 6-Hour

100YRLWA

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  10/06/94  TIME  05:47:59   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

  1           ID   LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:26AUG94  FILE:100YRLW7.DAT
  2           ID   1 MINUTE INTERVAL IN ITCARD
  3           ID   100-YEAR 6-HOUR STORM 1.6 INCHES
  4           ID   POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
  5           ID   DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
  6           ID   CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
  7           ID   BASELINE:  NO ADJUSTMENT TO ANY CURVE NUMBERS
  8           ID   NEW SUBBASIN CONFIGURATION
              *DIAGRAM
  9           IT       1       0       0     450
 10           IO       5
 11           IN       5
 12           JD     1.6     .01
              * RAINFALL DISTRIBUTION FROM CLARK COUNTY MANUAL LESS THAN 10 SQ. MILES
 13           PC       0       2     5.7     7.0     8.7    10.8    12.4    13.0    13.0
 14           PC    13.0    13.0    13.0    13.3    14.0    14.2    14.8    15.8    17.2    18.1
 15           PC    19.0    19.7    19.9    20.0    20.1    20.4    21.4    22.9    24.1    24.9
 16           PC    25.1    25.6    27.0    27.8    28.1    28.3    29.5    32.2    35.2    40.9
 17           PC    49.9    59.0    71.0    74.4    78.1    81.2    81.9    83.5    85.1    85.6
 18           PC    86.0    86.8    87.6    88.8    91.0    92.6    93.7    95.0    97.0    97.6
 19           PC    98.2    98.5    98.7    98.9    99.0    99.3    99.3    99.4    99.5    99.8
 20           PC    99.8    99.9   100.0
 21           JD    1.55       1
 22           JD    1.38    9.99
              *

 23           KK   LWTS1
 24           KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 1
              *
              * DISCHARGE FOR APEX OF FAN 1
              *
 25           BA    0.61
 26           LS              .87
 27           UD    0.34
              *

 28           KK  RTCPA1
 29           KM   ROUTE FLOW FROM LWTS1 TO CPA (CONCENTRATION POINT A)
 30           RM       4     .08      .2
              *

 31           KK   LWTS2
```

```
 32          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 2
 33          BA    0.11
 34          LS              88
 35          UD    0.10
             *

 36          KK  RTCPA2
 37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
 38          RM       4     .09     0.2
             *
1                                          HEC-1 INPUT                                          PAGE  2

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


 39          KK   LWTS3
 40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 41          BA    0.47
 42          LS              77
 43          UD    0.20
             *
             *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
             *

 44          KK     CPA
 45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
 46          HC       3
             *

 47          KK   LTWS4
 48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
 49          BA    0.20
 50          LS              77
 51          UD    0.17
             *
             *  DISCHARGE FOR CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS4
             *
 52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   23       LWTS1
                V
                V
   28      RTCPA1
                .
                .
   31           .       LWTS2
                .           V
                .           V
   36           .      RTCPA2
                .           .
                .           .
   39           .           .       LWTS3
                .           .           .
                .           .           .
   44         CPA.......................
                .
                .
   47           .       LTWS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              MAY   1991               *
 *            VERSION 4.0.1E             *
 *                                       *
 *  RUN DATE  10/06/94  TIME  05:47:59   *
 *                                       *
 *****************************************

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

```
                LIQUID WASTE TREATMENT SYSTEM IN AREA 6      DATE:26AUG94  FILE:100YRLW7.DAT
                1 MINUTE INTERVAL IN ITCARD
                100-YEAR 6-HOUR STORM 1.6 INCHES
                POINT RAINFALL VALUES FROM NOAA ATLAS 2 VOL VII
                DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                BASELINE:  NO ADJUSTMENT TO ANY CURVE NUMBERS
                NEW SUBBASIN CONFIGURATION

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

   IT        HYDROGRAPH TIME DATA
                NMIN           1  MINUTES IN COMPUTATION INTERVAL
                IDATE      1   0  STARTING DATE
                ITIME       0000  STARTING TIME
                  NQ        450  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE      1   0  ENDING DATE
               NDTIME       0729  ENDING TIME
               ICENT          19  CENTURY MARK

             COMPUTATION INTERVAL    0.02 HOURS
                  TOTAL TIME BASE    7.48 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

12 JD        INDEX STORM NO. 1
                STRM         1.60  PRECIPITATION DEPTH
                TRDA         0.01  TRANSPOSITION DRAINAGE AREA

13 PI          PRECIPITATION PATTERN
```

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

```
21 JD        INDEX STORM NO. 2
                STRM         1.55  PRECIPITATION DEPTH
                TRDA         1.00  TRANSPOSITION DRAINAGE AREA
```

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 1.38 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

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	LWTS1	225.	3.80	38.	30.	30.	0.61		
+	ROUTED TO	RTCPA1	223.	3.88	38.	30.	30.	0.61		
+	HYDROGRAPH AT	LWTS2	74.	3.55	8.	6.	6.	0.11		
+	ROUTED TO	RTCPA2	70.	3.63	8.	6.	6.	0.11		
+	HYDROGRAPH AT	LWTS3	81.	3.68	12.	9.	9.	0.47		
+	3 COMBINED AT	CPA	313.	3.82	55.	44.	44.	1.19		
+	HYDROGRAPH AT	LTWS4	38.	3.63	5.	4.	4.	0.20		

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

```
          35          UD    0.10
                      *

          36          KK  RTCPA2
          37          KM   ROUTE FLOW FROM LWTS2 TO CPA (CONCENTRATION POINT A)
          38          RM       4     .09      .2
                      *
1                                                HEC-1 INPUT                                                PAGE  2

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


          39          KK   LWTS3
          40          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 3
          41          BA    0.47
          42          LS              77
          43          UD    0.20
                      *
                      *  CONCENTRATION POINT A (CPA) IS THE APEX OF THE SECONDARY FAN
                      *

          44          KK     CPA
          45          KM   COMBINE FLOW ROUTED FROM LWTS1 AND LWTS2 WITH FLOW FROM LWTS3
          46          HC       3
                      *

          47          KK   LWTS4
          48          KM   BASIN RUNOFF CALCULATION FOR LIQUID WASTE TREATMENT SYSTEM SUBBASIN 4
          49          BA    0.20
          50          LS              77
          51          UD    0.17
                      *
                      *  DISCHARGE FROM CONCENTRATION POINT B (CPB) IS THE DISCHARGE FROM LWTS3
                      *
          52          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23       LWTS1
                 V
                 V
    28      RTCPA1
                 .
                 .
    31           .       LWTS2
                 .           V
                 .           V
    36           .      RTCPA2
                 .           .
                 .           .
    39           .           .       LWTS3
                 .           .           .
                 .           .           .
    44         CPA.......................
                 .
                 .
    47           .       LWTS4

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************                    ****************************************
*                                         *                    *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *                    *    U.S. ARMY CORPS OF ENGINEERS      *
*              MAY   1991                 *                    *    HYDROLOGIC ENGINEERING CENTER     *
*            VERSION 4.0.1E               *                    *          609 SECOND STREET           *
*                                         *                    *       DAVIS, CALIFORNIA 95616        *
*  RUN DATE  10/06/94  TIME  06:33:52     *                    *           (916) 551-1748             *
*                                         *                    *                                      *
*****************************************                    ****************************************
```

LIQUID WASTE TREATMENT SYSTEM IN AREA 6 DATE:23AUG94 FILE:10YRLW5.DAT
1 MINUTE INTERVAL IN ITCARD
10-YEAR 6-HOUR STORM 1.1 INCHES

```
                    POINT RAINFALL VALUE FROM NOAA ATLASS 2 VOL VII
                    DEPTH-AREA REDUCTION FACTORS FROM TABLE 502 IN
                    CLARK COUNTY HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL (CCRFCD, 1990)
                    BASELINE -- CURVE NUMBERS NOT ADJUSTED
                    NEW SUBBASIN CONFIGURATION

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

   IT          HYDROGRAPH TIME DATA
                     NMIN          1  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        450  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       0729  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.02 HOURS
                   TOTAL TIME BASE    7.48 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

12 JD          INDEX STORM NO. 1
                    STRM        1.10  PRECIPITATION DEPTH
                    TRDA        0.01  TRANSPOSITION DRAINAGE AREA

13 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
                  0.26      0.26      0.26      0.26      0.26      0.34      0.34      0.34      0.34      0.34
                  0.42      0.42      0.42      0.42      0.42      0.32      0.32      0.32      0.32      0.32
                  0.12      0.12      0.12      0.12      0.12      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                  0.06      0.06      0.06      0.06      0.06      0.14      0.14      0.14      0.14      0.14
                  0.04      0.04      0.04      0.04      0.04      0.12      0.12      0.12      0.12      0.12
                  0.20      0.20      0.20      0.20      0.20      0.28      0.28      0.28      0.28      0.28
                  0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18      0.18
                  0.14      0.14      0.14      0.14      0.14      0.04      0.04      0.04      0.04      0.04
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.20      0.20      0.20      0.20      0.20
                  0.30      0.30      0.30      0.30      0.30      0.24      0.24      0.24      0.24      0.24
                  0.16      0.16      0.16      0.16      0.16      0.04      0.04      0.04      0.04      0.04
                  0.10      0.10      0.10      0.10      0.10      0.28      0.28      0.28      0.28      0.28
                  0.16      0.16      0.16      0.16      0.16      0.06      0.06      0.06      0.06      0.06
                  0.04      0.04      0.04      0.04      0.04      0.24      0.24      0.24      0.24      0.24
                  0.54      0.54      0.54      0.54      0.54      0.60      0.60      0.60      0.60      0.60
                  1.14      1.14      1.14      1.14      1.14      1.80      1.80      1.80      1.80      1.80
                  1.82      1.82      1.82      1.82      1.82      2.40      2.40      2.40      2.40      2.40
                  0.68      0.68      0.68      0.68      0.68      0.74      0.74      0.74      0.74      0.74
                  0.62      0.62      0.62      0.62      0.62      0.14      0.14      0.14      0.14      0.14
                  0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32      0.32
                  0.10      0.10      0.10      0.10      0.10      0.08      0.08      0.08      0.08      0.08
                  0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16      0.16
                  0.24      0.24      0.24      0.24      0.24      0.44      0.44      0.44      0.44      0.44
                  0.32      0.32      0.32      0.32      0.32      0.22      0.22      0.22      0.22      0.22
                  0.26      0.26      0.26      0.26      0.26      0.40      0.40      0.40      0.40      0.40
                  0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12      0.12
                  0.06      0.06      0.06      0.06      0.06      0.04      0.04      0.04      0.04      0.04
                  0.04      0.04      0.04      0.04      0.04      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02
                  0.06      0.06      0.06      0.06      0.06      0.00      0.00      0.00      0.00      0.00
                  0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02      0.02

21 JD          INDEX STORM NO. 2
                    STRM        1.07  PRECIPITATION DEPTH
                    TRDA        1.00  TRANSPOSITION DRAINAGE AREA

 0 PI            PRECIPITATION PATTERN
                  0.40      0.40      0.40      0.40      0.40      0.74      0.74      0.74      0.74      0.74
```

0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

22 JD INDEX STORM NO. 3

STRM 0.95 PRECIPITATION DEPTH

TRDA 9.99 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

0.40	0.40	0.40	0.40	0.40	0.74	0.74	0.74	0.74	0.74
0.26	0.26	0.26	0.26	0.26	0.34	0.34	0.34	0.34	0.34
0.42	0.42	0.42	0.42	0.42	0.32	0.32	0.32	0.32	0.32
0.12	0.12	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.06	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.14
0.04	0.04	0.04	0.04	0.04	0.12	0.12	0.12	0.12	0.12
0.20	0.20	0.20	0.20	0.20	0.28	0.28	0.28	0.28	0.28
0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
0.14	0.14	0.14	0.14	0.14	0.04	0.04	0.04	0.04	0.04
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.20	0.20	0.20	0.20	0.20
0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24	0.24
0.16	0.16	0.16	0.16	0.16	0.04	0.04	0.04	0.04	0.04
0.10	0.10	0.10	0.10	0.10	0.28	0.28	0.28	0.28	0.28
0.16	0.16	0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06
0.04	0.04	0.04	0.04	0.04	0.24	0.24	0.24	0.24	0.24
0.54	0.54	0.54	0.54	0.54	0.60	0.60	0.60	0.60	0.60
1.14	1.14	1.14	1.14	1.14	1.80	1.80	1.80	1.80	1.80
1.82	1.82	1.82	1.82	1.82	2.40	2.40	2.40	2.40	2.40
0.68	0.68	0.68	0.68	0.68	0.74	0.74	0.74	0.74	0.74
0.62	0.62	0.62	0.62	0.62	0.14	0.14	0.14	0.14	0.14
0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08
0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44
0.32	0.32	0.32	0.32	0.32	0.22	0.22	0.22	0.22	0.22
0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.40	0.40
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
0.06	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.04
0.04	0.04	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

1

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	LWTS1	101.	3.82	17.	14.	14.	0.61		
+	ROUTED TO	RTCPA1	100.	3.90	17.	14.	14.	0.61		
+	HYDROGRAPH AT	LWTS2	36.	3.55	4.	3.	3.	0.11		
+	ROUTED TO	RTCPA2	34.	3.63	4.	3.	3.	0.11		
+	HYDROGRAPH AT	LWTS3	17.	3.80	3.	3.	3.	0.47		
+	3 COMBINED AT	CPA	128.	3.87	23.	19.	19.	1.19		
+	HYDROGRAPH AT	LWTS4	8.	3.78	1.	1.	1.	0.20		

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

APPENDIX E

Flood Hazards from FEMA FAN Model Output

FEMA FAN MODEL OUTPUT
FOR FLOOD HAZARD ZONE DELINEATION
OF
CP-NORTH ALLUVIAL FAN

(Discharges in Appendix C)

100-Year Hazard Delineation for CP-North

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	26	26
10	101	115
25	235	200
100	375	394

MEAN = 1.406643
STANDARD DEVIATION = 0.510922
SKEW = 0.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 115
50-YEAR DISCHARGE = 286
100-YEAR DISCHARGE = 394
500-YEAR DISCHARGE = 754

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.2402+LOG(Q)

MEAN OF Z = 1.646801

[illegible]

SKEW = 0.000000
TRANSFORMATION CONSTANT = 4.070431

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
0.5	0.3	49	0.29308	0.46970		2698

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	1.7384 Q	1.0000	WIDTH (FT)
3.5	0.4	68	0.20373	0.36075		2072
4.5	0.6	238	0.02945	0.07987		459

MULTIPLE-CHANNEL REGION

SLOPE = 0.0675000
N-VALUE = 0.0400000

DEPTHS GREATER THAN 0.5 FOOT HAVE PROBABILITIES LESS THAN .01

FEMA FAN MODEL OUTPUT
FOR FLOOD HAZARD ZONE DELINEATION
OF
NEWS NOB ALLUVIAL FAN

(Discharges in Appendix C)

100-Year Hazard Delineation for News Nob

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	28	27
10	131	154
25	359	291
100	591	632

MEAN = 1.437689
STANDARD DEVIATION = 0.586041
SKEW = 0.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 154
50-YEAR DISCHARGE = 438
100-YEAR DISCHARGE = 632
500-YEAR DISCHARGE = 1332

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.3160+LOG(Q)

MEAN OF Z = 1.753658
STANDARD DEVIATION = 0.586041
SKEW = 0.000000
TRANSFORMATION CONSTANT = 4.335862

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: 1.0000 Q	2.0700 Q	WIDTH (FT)
0.5	0.3	49	0.33728	0.54597	3341

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: 1.0000 Q	2.0700 Q	WIDTH (FT)
3.5	0.4	68	0.25396	0.44788	2741
4.5	0.6	238	0.05595	0.14980	917

MULTIPLE-CHANNEL REGION

SLOPE = 0.0290000
N-VALUE = 0.0400000

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	2.0700 Q	1.0000	WIDTH (FT)
0.5	0.3	447	0.01944	0.06582		1531

VELOCITIES BETWEEN 3.1 AND 3.4 FT/SEC

APPENDIX D

Skew Coefficient Analyses Using FEMA FAN Model

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

CP-NORTH ALLUVIAL FAN (Model Set 1)

Model Set 1: CP-North Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	26	26
10	101	118
25	216	172
100	225	245

MEAN = 1.295514
STANDARD DEVIATION = 0.688650
SKEW = -1.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 118
50-YEAR DISCHARGE = 210
100-YEAR DISCHARGE = 245
500-YEAR DISCHARGE = 312

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.6430+0.7594 LOG(Q)

MEAN OF Z = 1.626853
STANDARD DEVIATION = 0.522981
SKEW = -1.000000
TRANSFORMATION CONSTANT = 3.889320

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	4.3954 Q 0.7594	WIDTH (FT)
0.5	0.3	49	0.32297	0.52076	2858

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	4.3954 Q 0.7594	WIDTH (FT)
3.5	0.4	68	0.23196	0.40211	2207
4.5	0.6	238	0.01196	0.02870	158

APPENDIX D

Skew Coefficient Analyses Using FEMA FAN Model

FEMA FAN MODEL OUTPUT OF SKEW COEFFICIENT ANALYSIS FOR

CP-NORTH ALLUVIAL FAN (Model Set 1)

Model Set 1: CP-North Apex

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	26	26
10	101	118
25	216	172
100	225	245

MEAN = 1.295514
STANDARD DEVIATION = 0.688650
SKEW = -1.0

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 118
50-YEAR DISCHARGE = 210
100-YEAR DISCHARGE = 245
500-YEAR DISCHARGE = 312

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.6430+0.7594 LOG(Q)

MEAN OF Z = 1.626853
STANDARD DEVIATION = 0.522981
SKEW = -1.000000
TRANSFORMATION CONSTANT = 3.889320

SINGLE-CHANNEL REGION

ENERGY (FT)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	4.3954 Q 0.7594	WIDTH (FT)
0.5	0.3	49	0.32297	0.52076	2858

VELOCITY (FT/SEC)	DEPTH (FT)	DISCHARGE (CFS)	PROBABILITY OF DISCHARGE BEING EXCEEDED AT THE APEX BY: Q	4.3954 Q 0.7594	WIDTH (FT)
3.5	0.4	68	0.23196	0.40211	2207
4.5	0.6	238	0.01196	0.02870	158

APPENDIX F

Yucca Lake Water Volume Calculations

Raytheon Services Nevada

Title: YUCCA FLAT WATERSHED MMT.

Job number 79002
Sheet 1 of 1
By JM Date 7/13

YUCCA FLAT WATERSHED

PLANIMETER : 118.5 in^2

SCALE (METRIC)

1 : 100,000

1 cm = 1 m

1 cm = 1 km

1 cm^2 = 1 km^2

CONVERSIONS.

$km^2 \times 0.4 = mi^2$

$in^2 \times 6.5 = cm^2$

$$118.5\,in^2 \left(\frac{6.5\,cm^2}{1\,in^2}\right) = 770.25\,cm^2$$

$$770.5\,cm^2 \left(\frac{1\,km^2}{1\,cm^2}\right) = 770.5\,km^2$$

$$770.5\,km^2 \left(\frac{0.4\,mi^2}{1\,km^2}\right) = 308.1\,mi^2$$

WATERSHED AREA = 308.10 mi^2

$$308.10\,mi^2 \left(\frac{640\text{ ACRES}}{1\,mi^2}\right) = 197{,}184\text{ ACRES}$$

Raytheon Services Nevada

Title: YUCCA LAKE VOLUME ESTIMATE

Job number 79002
Sheet 1 of 5
By [illegible] Date 7/13

YUCCA LAKE VOLUME ESTIMATE @ (INTERPOLATED) 3925' MS

MAP SCALE: 1 IN = 2000 FT

$1 IN^2 = 4{,}000{,}000 FT^2$

$$54.275 IN^2 \text{ (PLANIMETER)} \left(\frac{4000000 FT^2}{1 IN^2}\right) = 217{,}100{,}000 F$$

$$217{,}100{,}000 FT^2 \left(\frac{1 MI^2}{27{,}878{,}400 FT^2}\right) = 7.79 MI^2$$

ASSUME LAKE BOTTOM ELEVATION IS @ 3920'

3925' − 3920' = 5 FT OF WATER

CONVERSION: $1 MI^2 = 640$ ACRES

$$7.79 MI^2 \left(\frac{640 \text{ ACRES}}{1 MI^2}\right) = 4985.6 \text{ ACRES}$$

VOLUME @ 3925':

4985.6 ACRES (5 FT) = 24,928.0 ACRE FT

AMOUNT OF PRECIPITATION OVER WATERSHED TO PRODUCE THIS VOLUME:

/24 928 ACRE FT/ \ = 0.13 FT

Raytheon Services Nevada

Title: YUCCA LAKE VOLUME ESTIMATE

Job number 79002
Sheet 2 of 6
By JM Date 7/13

YUCCA LAKE VOLUME ESTIMATE @ 3930' MSL

MAP SCALE. 1 IN = 2000 FT

$1\ IN^2 = 4{,}000{,}000\ FT$

$$68.09\ IN^2\ (\text{PLANIMETER}) \left(\frac{4000000\ FT^2}{1\ IN^2}\right) = 272{,}360{,}000\ FT^2$$

$$272{,}360{,}000\ FT^2 \left(\frac{1\ MI^2}{27{,}878{,}400\ FT^2}\right) = 9.77\ MI^2$$

ASSUME LAKE BOTTOM ELEVATION IS @ 3920'

3930' − 3920' = 10 FT OF H_2O

CONVERSION: $1\ MI^2 = 640$ ACRES

$$9.77\ MI^2 \left(\frac{640\ ACRES}{1\ MI^2}\right) = 6{,}252.8\ ACRES$$

VOLUME @ 3930':

6252.8 ACRES (10 FT) = 62,528.0 ACRE-FT

AMOUNT OF PRECIPITATION OVER WATERSHED TO PRODUCE THIS VOLUME:

$$\left(62528\ ACRE\ FT \Big/ 197184\ ACRES\right) = 0.32\ FT$$

Raytheon Services Nevada

Title: YUCCA LAKE VOLUME ESTIMATE

Job number 79002
Sheet 3 of 6
By JM Date 7/13

YUCCA LAKE VOLUME ESTIMATE @ (INTERPOLATED) 3935' MSL

MAP SCALE: 1 IN = 2000 FT

$1\ IN^2 = 4000000\ FT^2$

$81.034\ in^2\ (\text{PLANIMETER}) \left(\frac{4000000\ FT^2}{1\ IN^2}\right) = 324\,136\,000\ FT^2$

$324\,136\,000\ FT^2 \left(\frac{1\ MI^2}{27\,878\,400\ FT^2}\right) = 11.63\ mi^2$

ASSUME LAKE BOTTOM ELEVATION IS @ 3920'

3935' − 3920' = 15 FT OF H_2O

CONVERSION: $1\ MI^2 = 640$ ACRES

$11.63\ mi^2 \left(\frac{640\ ACRES}{1\ mi}\right) = 7{,}443.2$ ACRES

VOLUME @ 3935':

7443.2 ACRES (15 FT) = 111,648.0 ACRE-FT

AMOUNT OF PRECIPITATION OVER WATERSHED TO PRODUCE THIS VOLUME:

$\left(\frac{111{,}648\ ACRE\ FT}{\qquad\qquad}\right) = 0.57\ FT$

Raytheon Services Nevada

Title: YUCCA LAKE VOLUME ESTIMATE

Job number 79002
Sheet 4 of 15
By JM Date 7/13

YUCCA LAKE VOLUME ESTIMATE @ 3940' MSL

MAP SCALE: 1 IN = 2000 FT

$1\ IN^2 = 4000000\ FT^2$

$$93.4916\ IN^2 \left(\frac{4000000\ FT^2}{IN^2}\right) = 373{,}984{,}000\ FT^2$$

$$373{,}984{,}000\ FT^2 \left(\frac{1\ MI^2}{27878400\ FT^2}\right) = 13.42\ MI^2$$

ASSUME LAKE BOTTOM ELEVATION IS @ 3920'

3940' - 3920' = 20 FT OF H_2O

CONVERSION: $1\ MI^2 = 640$ ACRES

$$13.42\ MI^2 \left(\frac{640\ ACRES}{1\ MI}\right) = 8{,}588.8\ ACRES$$

VOLUME @ 3940':

8,588.8 ACRES (20 FT) = 171,776.0 ACRE FT

AMOUNT OF PRECIPITATION OVER WATERSHED TO PRODUCE THIS VOLUME.

$$\left(171{,}776\ ACRE\ FT \Big/ 197184\ ACRES\right) = 0.87\ FT$$

PRECIPITATION = 10.45 in

YUCCA LAKE VOLUME ESTIMATE

YUCCA LAKE VOLUME ESTIMATE @ 3945 FT-MSL

MAP SCALE: 1 IN = 2000 FT

1 IN = 4000000 FT^2

$$103.73\,IN^2\left(\frac{4000000\,FT^2}{1\,IN^2}\right) = 414{,}920{,}000\,FT^2$$

$$414{,}920{,}000\,FT^2\left(\frac{1\,MI^2}{27878400\,FT^2}\right) = 14.88\,MI^2$$

ASSUME LAKE BOTTOM IS @ 3920'

3945 - 3920 = 25 FT OF H_2O

CONVERSION: 1 MI^2 = 640 ACRES

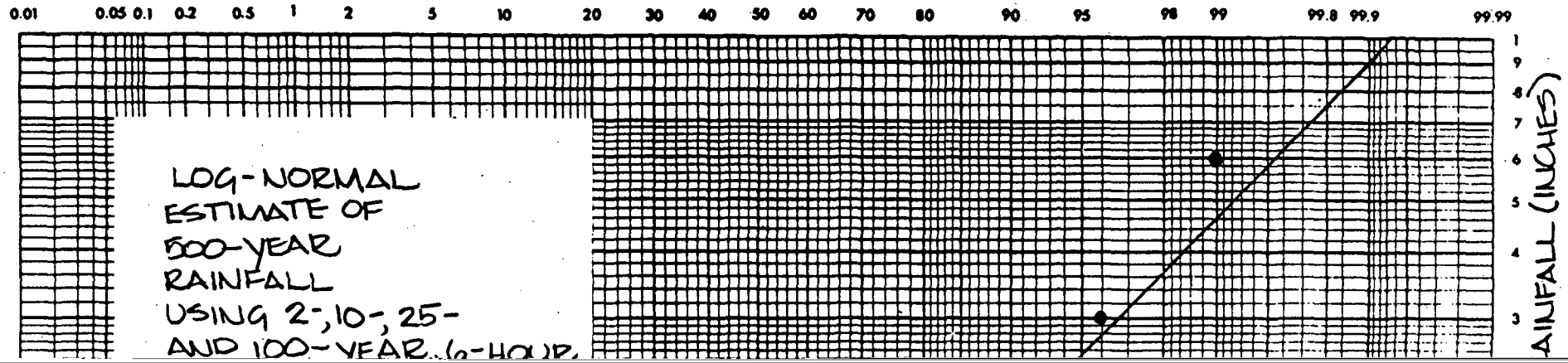
$$14.88\,MI^2\left(\frac{640\,ACRES}{1\,MI}\right) = 9{,}523.2\,ACRES$$

VOLUME @ 3945':

9,523.2 ACRES (25 FT) = 238,080 ACRE-FT

APPENDIX G

500-Year, 6-Hour Rainfall Estimate


0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
1
9
8
7
6
5
4
3
RAINFALL (INCHES)
LOG-NORMAL
ESTIMATE OF
500-YEAR
RAINFALL
USING 2-, 10-, 25-
AND 100-YEAR 6-HOUR

APPENDIX H

Sheetflow Depth Calculations

SHEETFLOW

Q = DISCHARGE (ft^3/sec)
V = VELOCITY (ft/sec)
A = AREA (ft^2) (For a rectangular channel, area = depth * width)
R = HYDRAULIC RADIUS (ft) (For a shallow channel, assume R = depth)
S = SLOPE (ft/ft)
n = MANNING COEFFICIENT
W = WIDTH (ft)
d = DEPTH (ft)

EQUATIONS:

$$Q = VA$$

$$V = \frac{1.49}{n} R^{2/3} S^{1/2}$$

$$Q = \frac{1.49}{n} R^{2/3} S^{1/2} A$$

CALCULATIONS:

$$Q = \frac{1.49}{n} d^{2/3} S^{1/2} dW$$

$$Q = \frac{1.49}{n} d^{5/3} S^{1/2} W$$

$$d = \left[\frac{Qn}{(1.49 S^{1/2} W)} \right]^{3/5}$$

SHEETFLOW DEPTH CALCULATIONS

SHEETFLOW FROM CPA (NEWS NOB ALLUVIAL FAN) BELOW ~~ZONE~~ AO DELINEATION

Q_{100} (Q_{CPA100}) = 591 cfs (APPENDIX C)

Q_{500} (Q_{CPA500}) = 1332 cfs (APPENDIX E)

$$d = \left(\frac{Qn}{1.49 S^{1/2} W}\right)^{3/5}$$

$$d_{100} = \left(\frac{(591)(0.04)}{(1.49)(0.029)^{1/2}(1531)}\right)^{3/5}$$

$d_{100} = 0.187 \approx 0.19$ FT

$$d_{500} = \left(\frac{(1332)(0.04)}{(1.49)(0.029)^{1/2}(1531)}\right)^{3/5}$$

$d_{500} = 0.304 \approx 0.30$ FT

SHEETFLOW DEPTHS < 1.0 FT FOR BOTH 100- & 500-YR FLOODS ∴

SHEETFLOW DEPTH CALCULATIONS

SHEETFLOW FROM LWTS4 CALCULATED AT CPB (NORTHWESTERN EDGE OF NEWS NOB ALLUVIAL FAN)

LWTS4 500-Year Discharge Calculation

AVULSION FACTOR = 1.5000

FLOOD FREQUENCY CURVE DEFINED BY LEAST-SQUARES FIT OF DATA

RETURN INTERVAL (YEARS)	INPUT DISCHARGE (CFS)	BEST FIT DISCHARGE (CFS)
2	1	1
10	10	12
25	45	33
100	103	115

MEAN = 0.018498
STANDARD DEVIATION = 0.826263
SKEW = 0.2

SUMMARY OF DISCHARGES:

10-YEAR DISCHARGE = 12
50-YEAR DISCHARGE = 63
100-YEAR DISCHARGE = 115
500-YEAR DISCHARGE = 396

STATISTICS AFTER TRANSFORMATION OF Y=LOG(Q) TO Z=0.6782+1.0823 LOG(Q)

MEAN OF Z = 0.698265
STANDARD DEVIATION = 0.894240
SKEW = 0.200000
TRANSFORMATION CONSTANT = 1.379157

RECEIVED
JUL 7 1995