

**Preliminary Drainage Report  
For  
Sonic Drive-Ins Gateway South  
Rio Rancho**

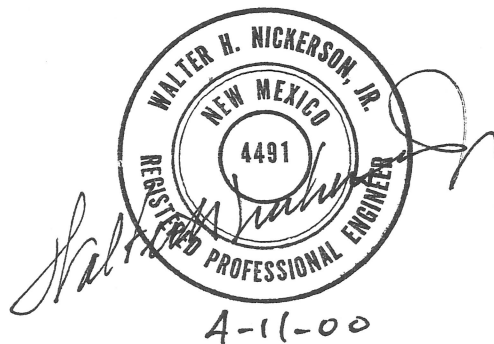
5/2/00  
**RECEIVED**  
148

**Prepared For:**

**Sonic Drive Ins  
Gateway South  
Las Cruces, NM 88005  
Ph: (505) 524-8998  
Fax: (505) 525-9232  
Job: N522-01M-650**

**Prepared By:**

**Community Sciences Corporation  
4481 Corrales Road  
Corrales, NM 87048  
Ph: 897-0000  
Fax: 898-5195**



## Table of Contents

1)	Purpose and Scope of this Report.....	1
2)	Site Location and Topography .....	1
3)	Engineering Parameters .....	2
4)	Computational Procedures .....	2
5)	Offsite Drainage.....	3
6)	Onsite Drainage .....	3
7)	Summary.....	3
8)	Appendixes	
	8.1 Vicinity Map	
	8.2 Offsite Drainage	
	8.3 Onsite Grading & Drainage Plan	
	8.4 AHYMO Calculations	

### ***1) Purpose and Scope***

The purpose of this report is to quantify storm runoff from the 100- year and 6 – hour frequency event for the existing conditions and for the proposed conditions for the development of a Sonic Drive In Site in a lot presently zoned C-1.

Because Sonic Drive Ins is seeking approval for a specific site plan or to obtain a building permit at this time, the main focus of this document is to show the proposed improvements for this site. With this in mind this report contains a Site/Drainage plan showing proposed site conditions (see appendix figure 8.3).

### ***2) Site Location and Topography***

The site is located on N.M.S.R. 528 in Gateway South Lot 9, please see the enclosed vicinity map located in the appendix (figure 8.1). The site in general is level with no real apparent slope. The area bounded to the South is N.M.S.R. 528 it is a fully improved arterial street including storm drain facilities. To the East of the site is an Access Street Drive, which includes Water, Sewer & Storm utility infrastructure. The land located West of the site is vacant land with natural vegetation and a gentle slope to the North. There is existing development to the East that includes a hotel establishment.

### ***3) Engineering Parameters***

In accordance to the Albuquerque Development Process Manual (DPM) all of the hydrological analysis is based on the 100 year frequency for the 6 hour and 24 hour storm duration. The rainfalls pertinent to the study are as follows:

<u>Storm Duration</u>	<u>100 Year Frequency</u>
1 Hour	1.9"
6 Hour	2.4"
24 Hour	3"

### ***4) Computational Procedures***

The methodology used in this study is generally consistent with the City of Albuquerque Development Process Manual (DPM), Section 22.2, Hydrology (rev. Jan. 1993) and the companion computer hydrology program, AHYMO (rev. Jan. 1994). This methodology is preferred in the surrounding metropolitan areas.

The hydrological analysis in this study is based on the 100-year frequency for the 6-hour and 24-hour duration storms. The AHYMO computer programs for this basin were run using both the 6-hour and 24-hour storms.

The hydrological analysis utilized follows standard engineering practice. Key points of confluence were selected, and subsequently the associated individual and aggregate contributing basins were defined.

Hydrological computations were accomplished by means of AHYMO computer modeling program (see appendix figure 8.4).



#### 5) *Offsite Drainage*

With the improvement to the North and East of the site (Access Drive and N.M.S.R. 528). The existing offsite drainage we found to be non-existent and have concluded to be self contained (see appendix figure 8.2).

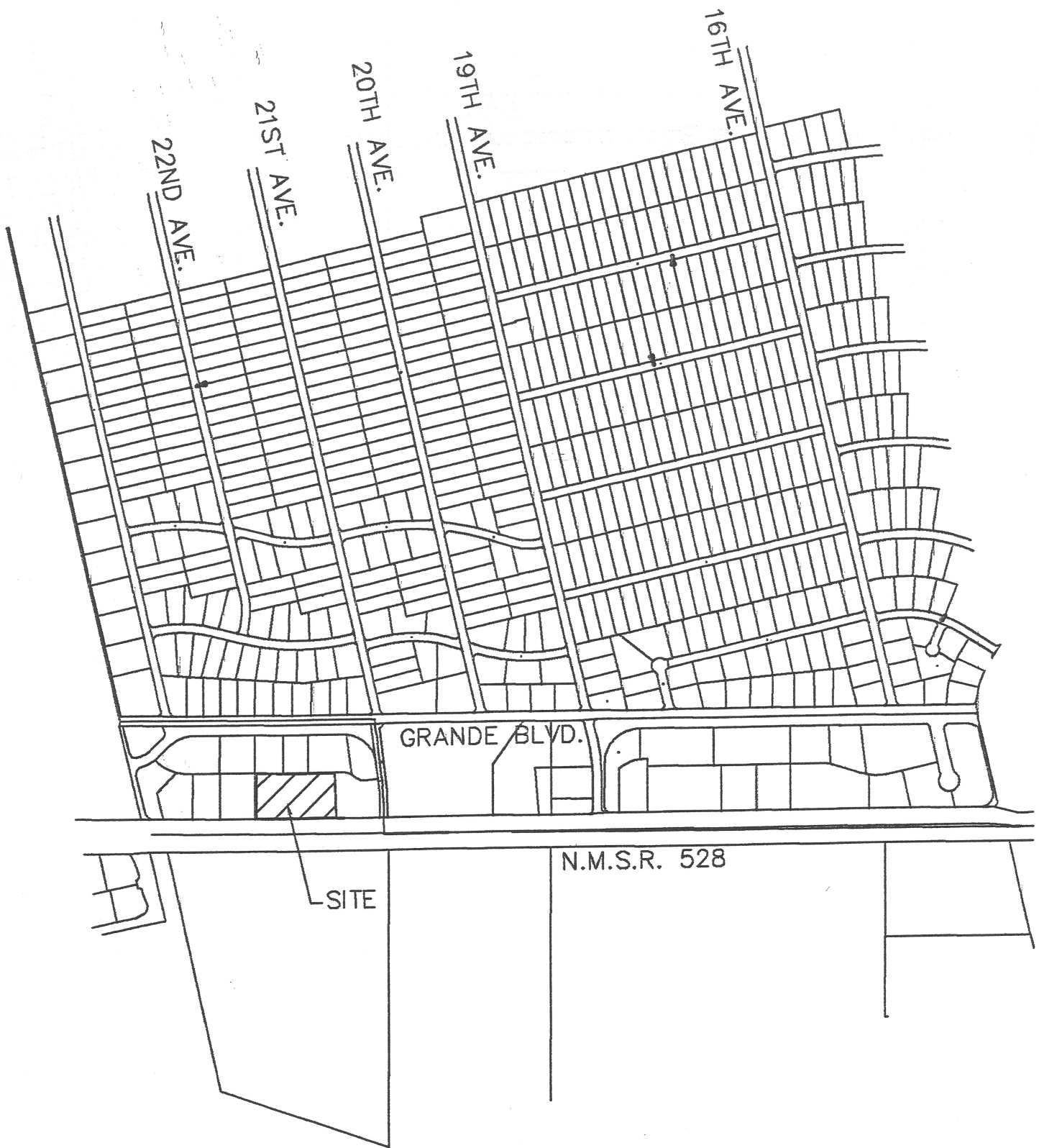
#### 6) *Onsite Drainage*

The existing condition of the site constitutes approximately 3.79 cfs at the peak 100-year 6-hour storm creating a volume of 0.1148 ac/ft. With the proposed improvements (see site layout) the change is an increase of 0.96 cfs for a total peak 100-year of 4.75 cfs and a volume increase of .0496 ac/ft. for a total volume runoff of 0.1644 ac/ft. With this minimal increase we have determined that ponding will not be necessary, and this quantity can be discharged to Access Drive which goes to a discharge pond at the South end of the site.

#### 7) *Summary*

In summary the preliminary grading & drainage concept is to build a site to an elevation of 5217 with a slight tilt to the plan to eliminate standing water. This will be collected by a gently sloped swale and routed to the southeast corner of the site then discharged to the Street.

## **APPENDIX**



DATE:  
MAR 2000

SCALE:  
1"=40'

CREW:

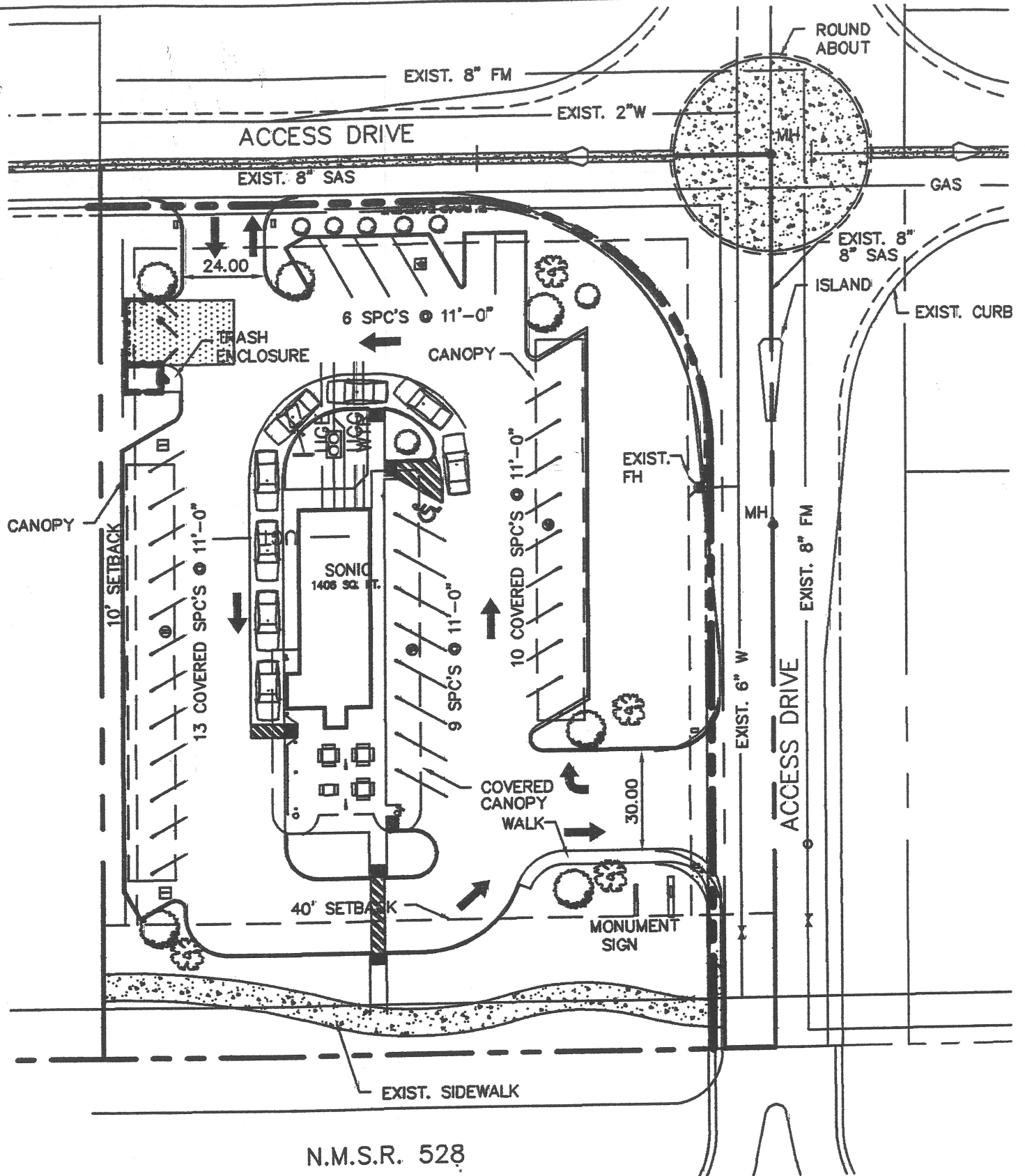
DRAWN  
LAG

JOB NO.  
490-03-800

**community  
sciences  
corporation**

LAND PLANNING - ENGINEERING - LAND SURVEYING  
P.O. BOX 1328, CORRALES, NEW MEXICO 87048  
PHONE 505/897-0000

VICINITY MAP  
SONIC DEVELOPMENT  
GATEWAY SOUTH



N.M.S.R. 528

DATE:  
MAR 2000  
SCALE:  
1"=40'  
CREW:  
DRAWN:  
LAG  
JOB NO.  
490-03-600

*community  
sciences  
corporation*

LAND PLANNING - ENGINEERING - LAND SURVEYING  
P.O. BOX 1328, CORRALES, NEW MEXICO 87048  
PHONE 505/897-0000

PROPOSED SITE PLAN  
SONIC DEVELOPMENT  
GATEWAY SOUTH

=(s16.67h8.5v0T=&18D

```

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
  RUN DATE (MON/DAY/YR) = 04/06/2000
  START TIME (HR:MIN:SEC) = 15:10:38      USER NO.= CSC.S94
  INPUT FILE = SONIC1.DAT

```

```
*
*      *Sonic @ Rio Rancho
*      *100 YEAR EXISTING CONDITIONS
*      *****
*      *Western & 528
*      *DA=1.22498 AC'S *** TC = 12 MIN ***
*      *****
START    TIME=0.0 HR PUNCH CODE=0 PRINT LINES=-6
RAINFALL TYPE=1 RAIN QUARTER=0.0
          RAIN ONE=1.9 IN RAIN SIX=2.2 IN
          RAIN DAY=2.8 IN DT=0.0333 HRS
```

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.  
DT = .033300 HOURS                      END TIME = 5.994000 HOURS

```

*
COMPUTE NM HYD
ID=1 HYD NO=1E DA=0.00191 SQ MI
PER A=0 PER B=0 PER C=88 PER D=12
TP=-0.1333 HR. MASS RAIN=-1

```

```

K = .072649HR      TP = .133300HR      K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .90489      CFS      UNIT VOLUME = .9861      B = 526.28
P60 = 1.9000
AREA = .000229 SQ MI      IA = .10000 INCHES
INF = .04000 INCHES PER HOUR RUNOFF COMPUTED BY INITIAL
ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

```

```

K = .106205HR      TP = .133300HR      K/TP RATIO = .796738
  SHAPE CONSTANT, N = 4.498737
UNIT PEAK = 4.8816      CFS      UNIT VOLUME = .9979      B = 387.15
  P60 = 1.9000
AREA = .001681 SQ MI      IA = .35000 INCHES
  INF = .83000 INCHES PER HOURRUNOFF COMPUTED BY INITIAL
  ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

```

```
*
PRINT HYD ID=1 CODE=1
```

HYDROGRAPH FROM AREA 1E

RUNOFF VOLUME = 1.12702 INCHES = .1148 ACRE-FeET  
 PEAK DISCHARGE RATE = 3.79 CFS AT 1.499 HOURS  
 BASIN AREA = .0019 SQ. MI.

```
*                                     *****  
*                                *Sonic*
```

\*  
 \*  
 COMPUTE NM HYD  
 \*100 YEAR DEVELOPED CONDITIONS  
 \*\*\*\*\*  
 ID=2 HYD NO=1D DA=0.00191 SQ MI  
 PER A=0 PER B=0 PER C=37 PER D=63  
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000  
 SHAPE CONSTANT, N = 7.106420  
 UNIT PEAK = 4.7507 CFS UNIT VOLUME = .9969  
 B = 526.28 P60 = 1.9000  
 AREA = .001203 SQ MI IA = .10000 INCHES  
 INF = .04000 INCHES PER HOUR RUNOFF COMPUTED BY INITIAL  
 ABSTRACTION/INFILTRATION NUMBER METHOD -  
 DT = .033300

K = .106205HR TP = .133300HR K/TP RATIO = .796738  
 SHAPE CONSTANT, N = 4.498737  
 UNIT PEAK = 2.0525 CFS UNIT VOLUME = .9940  
 B = 387.15 P60 = 1.9000  
 AREA = .000707 SQ MI IA = .35000 INCHES  
 INF = .83000 INCHES PER HOUR  
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -  
 DT = .033300

\*  
 \*  
 PRINT HYD ID=2 CODE=1  
 \*\*\*\*\*

HYDROGRAPH FROM AREA 1D

RUNOFF VOLUME = 1.61344 INCHES = .1644 ACRE-FEET  
 PEAK DISCHARGE RATE = 4.75 CFS AT 1.499 HOURS  
 BASIN AREA = .0019 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 15:10:38  
 (s0p10h4099T&l6D