CITY OF
Albuquerque
P.O. Box 1293 Albuquerque, NM 87103

November 27, 1996

Martin J. Chávez, Mayor

Ronald R. Bohannan, PE
Tierra West Dev Mgt Ser
4421 McCleod Rd NE Suite D
Albuquerque, NM 87109

RE: DRAINAGE REPORT FOR VAN CLEAVE SUBDIVISION (G-13/D17)
RECEIVED NOVEMBER 25, 1996 FOR SITE DEV PLAN, P PLAT & R GRADING
ENGINEER'S STAMP DATED 11-15-96

Dear Mr. Bohannan:

Based on the information included in the submittal referenced above, City Hydrology has the following comments that must be addressed:

Rearyard pond are only allowed for pervious areas. Any retention pond 18" or deeper must be fenced. It appears that a "flat" grading scheme is appropriate for this site (see attached criteria). The concept is to spread shallow ponding uniformly so that runoff evaporates or percolates quickly and causes minimum nuisance. Execute a Private Facility Drainage Covenant and submit it to the City for processing & recording (copy attached).

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer, Hydrology

c: Fred Aguirre, DRB 96-454

DRAINAGE INFORMATION SHEET

PROJECT TITLE: *VAN CLEAVE SUBDIVISION* **ZONE ATLAS/DRNG. FILE #:** *G-13 / D12*

DRB #: 96-454 **EPC #:** **WORK ORDER #:**

LEGAL DESCRIPTION: *Lots 6-A, 6-B, 6-C, BLOCK 1 VAN CLEAVE ACRES*

CITY ADDRESS: *NORTH OF VAN CLEAVE ROAD NEAR GRIEGOS ELEMENTARY SCHOOL*

ENGINEERING FIRM: *TIERRA WEST DEV. MAGT. SER.* **CONTACT:** *RONALD R. BOHANNAN OR SHAHAB BIAZAR*

ADDRESS: *4421 McCleod Rd. NE Suite D, 87109* **PHONE:** *(505) 883-7592*

OWNER: *GONZALES PROPERTIES* **CONTACT:** *DAVE GONZALES*

ADDRESS: *5925 EDITH, NE* **PHONE:** *(505) 345-7200*

ARCHITECT: **CONTACT:**

ADDRESS: **PHONE:**

SURVEYOR: *Precision Surveys* **CONTACT:** *Larry Medrano*

ADDRESS: *2929 Coors Blvd, NW Suite 105* **PHONE:** *(505) 839 - 0569*

CONTRACTOR: **CONTACT:**

ADDRESS: **PHONE:**

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- DRAINAGE PLAN
- CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- EROSION CONTROL PLAN
- ENGINEER'S CERTIFICATION
- OTHER

PRE-DESIGN MEETING:

- YES
- X NO
- COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- SKETCH PLAN APPROVAL
- X PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D. APPROVAL
- S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- SECTOR PLAN APPROVAL
- FINAL PLAT APPROVAL
- FOUNDATION PERMIT APPROVAL
- BUILDING PERMIT APPROVAL
- CERTIFICATE OF OCCUPANCY APPROVAL
- X GRADING PERMIT APPROVAL
- PAVING PERMIT APPROVAL
- S. A. D. DRAINAGE REPORT
- DRAINAGE REQUIREMENTS
- *OTHER*

DATE SUBMITTED: *11/22/96*

BY: *SARA McCOLLAM*

DRAINAGE REPORT

for

Van Cleave Subdivision

Prepared by

Tierra West Development Management Services
4421 McLeod Road NE, Suite D
Albuquerque, New Mexico 87109

Prepared for

Dave Gonzales
Gonzales Properties
5925 Edith, NE
Albuquerque, New Mexico 87107

October 1996

Ronald R. Bohannan P.E. No. 7868

RONALD RAY BOHANNAN
NEW MEXICO
11-25-96
REGISTERED PROFESSIONAL ENGINEER

NOV 25

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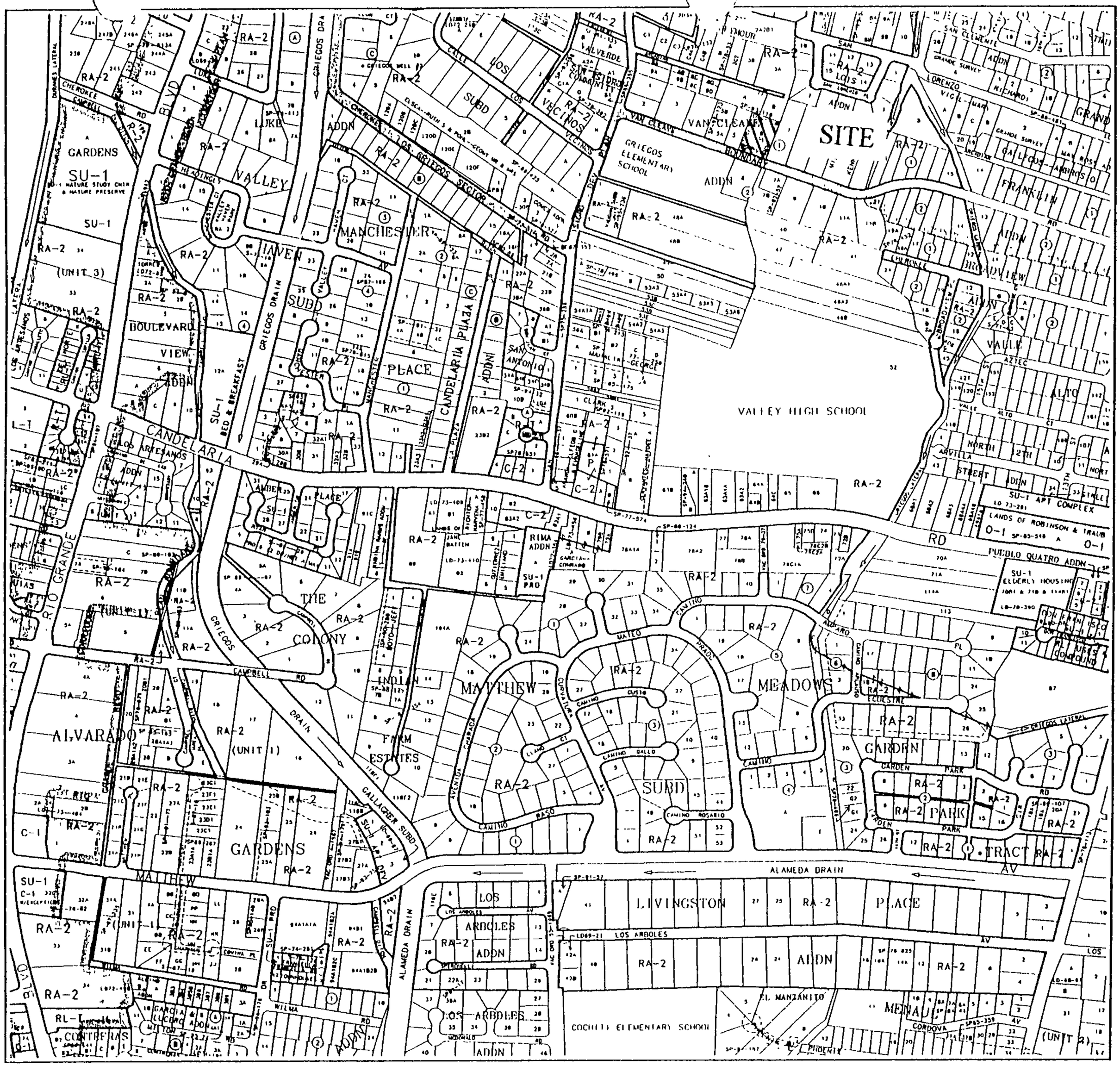

GRAPHIC SCALE IN FEET

250 0 500 1000

CITY OF Albuquerque

A Albuquerque G Geographic I Information S System

PLANNING DEPARTMENT

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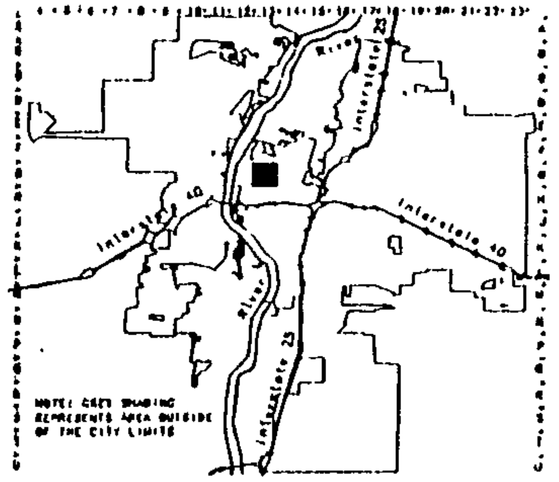
Map Amended through March 28, 1996



LEGAL DESCRIPTION

TION

R3E

SEC 6

UNIFORM PROPERTY CODE

1-013-090

G-13-Z

Location

Van Cleave Subdivision is a proposed three lot single family subdivision. It is located north of Van Cleave Road near Griegos Elementary School. The site is shown on the attached Zone Atlas Map G-13 and contains approximately 0.82 acres. The site is identified as lots 6-A, 6-B, 6-C, Block 1 Van Cleave Acres. The purpose of this report is to provide the drainage analysis and management plan for the subdivision.

Existing Drainage Conditions

The site is currently partially developed. However, the existing structures on the site will be removed with this proposal. There are no off-site flows entering the site. All flows to the south are captured by Van Cleave Road. The natural topography of the surrounding area drains away from the site. There is one existing basin on the site with an undeveloped runoff flow of 1.90 cfs. This basin drains away from the site to the west.

FEMA Map and Soil Conditions

The site is located on FEMA Map section 350002 panel 22 as shown on the attached excerpt. The map shows that the site lies within a 500 year flood plain.

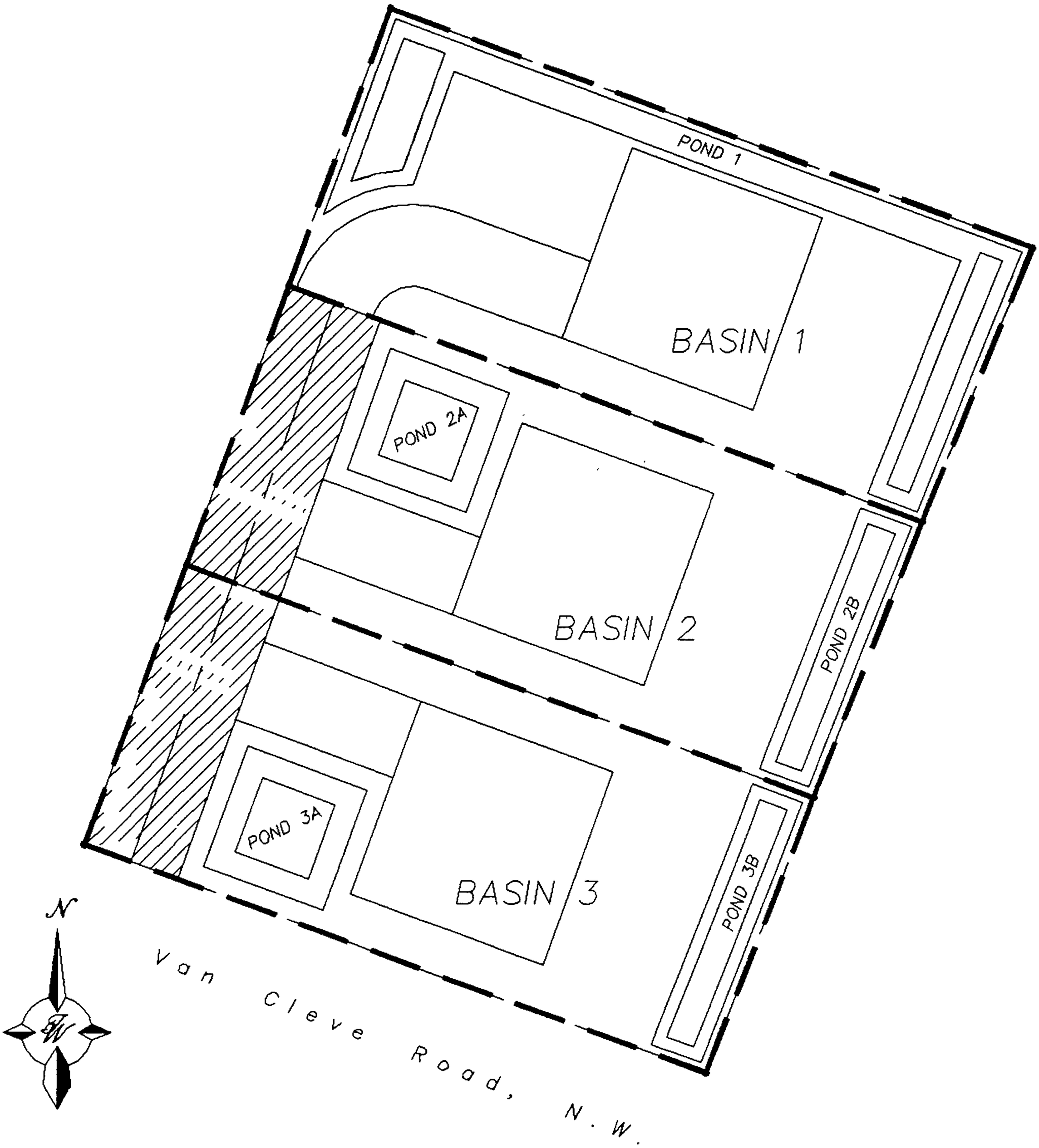
The site contains one soil type from the Soil Conservation Service Soil Survey of Bernalillo County. The soil is a Gila clay loam. It has slow runoff, a slight hazard of water erosion and moderate permeability.

On-Site Drainage Management Plan

The proposed drainage management plan is to collect the developed flows from each basin in front and back yard retention ponds. The size of the ponds has been designed using the 10 day volume from a 24 hour storm. There are three developed basins on the site. Basin 1 has a developed runoff flow of 1.26 cfs. A pond along the north end of the lot will have a storage capacity of 0.0453 ac-ft. This is greater than the required storage capacity of 0.0451 ac-ft. Basin 2 has a developed runoff flow of 1.24 cfs. Two ponds, one in the front yard and one in the back yard, will have a combined storage capacity of 0.0458 ac-ft. This is greater than the required storage capacity of 0.0445 ac-ft. Basin 3 has a developed runoff flow of 1.23 cfs. This basin will also have two ponds with a storage capacity of 0.0458 ac-ft which is greater than the required storage capacity of 0.0440 ac-ft.

Summary

There will be three proposed basin on the site. Basin 1 has a developed runoff flow of 1.26 cfs, Basin 2 has a flow 1.24 cfs and Basin 3 has a flow 1.23 cfs. The runoff from each basin will be stored in a retention pond located within each basin.



BASIN LAYOUT

Runoff
Calculations

RUNOFF CALCULATIONS

The site is @ Zone 2

LAND TREATMENT

Proposed
B = 60%
D = 40 %

Existing
B = 100%

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the summary output from AHYMO calculations.

Also see the following summary tables.

Runoff
Summary Tables
for
Proposed and Existing
Drainage Basins

DRAINAGE BASINS

Existing

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
1	35708.03	0.8197	0.001281

Proposed

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
1	12059.54	0.2768	0.000433
2	11902.65	0.2732	0.000427
3	11745.84	0.2696	0.000421

RUNOFF CALCULATION RESULTS

Existing

BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
1	1.9	0.78	0.053	0.019

Proposed

SUB-BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
1	1.26	0.82	0.050	0.031
2	1.24	0.8	0.049	0.031
3	1.23	0.79	0.049	0.030

Ponding
Calculations

POND SUMMARY

	BASIN 1		BASIN 2		BASIN 3	
	Pond 1A		Pond 2A	Pond 2B	Pond 3A	Pond 3B
Area of Pond Top (SF)	2572.33		966.17	889.72	966.17	889.72
Area of Pond Bottom (SF)	715.42		364.17	437.07	364.17	437.07
Depth of Pond (FT)	1.20		2.00	1.00	2.00	1.00
Volume (CF)	1972.65		1330.34	663.40	1330.34	663.40
Volume (AC-FT)	0.0453		0.0305	0.0152	0.0305	0.0152
Volume Required (CF)	1965.71		1940.13		1914.57	
Volume Required (AC-FT)	0.0451		0.0445		0.0440	
Volume Provided (CF)	1972.65		1993.735		1993.735	
Volume Provided (AC-FT)	**0.0453**		**0.0458**		**0.0458**	

<u>VOLUME OF POND</u>

V=(At + Ab)/2 * D

At = Area of Top
Ab= Area of Bottom
D = Depth

VOLUME CALCULATIONS FOR 10-DAY STORM

ZONE = 2

DRAINAGE BASINS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI²)
1	12059.54	0.27685	0.000433

$$E = \frac{EA(AA) + EB(AB) + EC(AC) + ED(AD)}{AA + AB + AC + AD}$$

V-360 = E (AA + AB + AC + AD) / 12 in/ft

V-10 Day = V-360 + AD (P-10 Day - P-360) / 12 in/ft

EA = 0.53
EB = 0.78
EC = 1.13
ED = 2.12

AA = 0.00%
AB = 60.00%
AC = 0.00%
AD = 40.00%

P-60 = 2.01
P-360 = 2.35
P-1440 = 2.75
P-10 Day = 3.95

E =	**1.3160**	**IN**
V-360 =	**0.0304**	**AC-FT**
AD =	**0.1107**	**AC**
V-10 Day =	**0.0451**	**AC-FT**
V-10 DAY =	**1965.71**	**CF**

V102.WK4

VOLUME CALCULATIONS FOR 10-DAY STORM

ZONE = 2

DRAINAGE BASINS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
2	11902.65	0.27325	0.000427

$$E = \frac{EA(AA) + EB(AB) + EC(AC) + ED(AD)}{AA + AB + AC + AD}$$

V-360 = E (AA + AB + AC + AD) / 12 in/ft

V-10 Day = V-360 + AD (P-10 Day - P-360) / 12 in/ft

EA = 0.53
EB = 0.78
EC = 1.13
ED = 2.12

AA = 0.00%
AB = 60.00%
AC = 0.00%
AD = 40.00%

P-60 = 2.01
P-360 = 2.35
P-1440 = 2.75
P-10 Day = 3.95

E =	**1.3160**	**IN**
V-360 =	**0.0300**	**AC-FT**
AD =	**0.1093**	**AC**
V-10 Day =	**0.0445**	**AC-FT**
V-10 DAY =	**1940.13**	**CF**

V102.WK4

VOLUME CALCULATIONS FOR 10-DAY STORM

ZONE = 2

DRAINAGE BASINS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
3	11745.84	0.26965	0.000421

$$E = \frac{EA(AA) + EB(AB) + EC(AC) + ED(AD)}{AA + AB + AC + AD}$$

V-360 = E (AA + AB + AC + AD) / 12 in/ft

V-10 Day = V-360 + AD (P-10 Day - P-360) / 12 in/ft

EA = 0.53
EB = 0.78
EC = 1.13
ED = 2.12

AA = 0.00%
AB = 60.00%
AC = 0.00%
AD = 40.00%

P-60 = 2.01
P-360 = 2.35
P-1440 = 2.75
P-10 Day = 3.95

E =	**1.3160**	**IN**
V-360 =	**0.0296**	**AC-FT**
AD =	**0.1079**	**AC**
V-10 Day =	**0.0440**	**AC-FT**
V-10 DAY =	**1914.57**	**CF**

V102.WK4

AHYMO
Runoff Input
and
Summary Output
for
Proposed and Existing
Drainage Basins

```
*****************************************************************
*                          VAN CLEAVE                           *
*****************************************************************
*       100-YEAR, 24-HR STORM  (UNDER EXISTING CONDITIONS)      *
*****************************************************************
*
START                TIME=0.0
*
* BASIN 1
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.02253 HR
COMPUTE NM HYD       ID=1 HYD NO=100.1 AREA=0.001281 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
*
*****************************************************************
*        10-YEAR, 24-HR STORM  (UNDER EXISTING CONDITIONS)      *
*****************************************************************
*
START                TIME=0.0
*
* BASIN 1
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                     RAIN DAY=1.83 IN DT=0.02253 HR
COMPUTE NM HYD       ID=1 HYD NO=110.1 AREA=0.001281 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
*
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =10/21/1996

INPUT FILE = A:E.DAT USER NO.= R_BOHANN.I01

PAGE = 1

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START											
RAINFALL TYPE= 2										TIME=	.00
COMPUTE NM HYD	100.10	-	1	.00128	1.90	.053	.77901	1.532	2.314	RAIN24=	2.750
START										PER IMP=	.00
RAINFALL TYPE= 2										TIME=	.00
COMPUTE NM HYD	110.10	-	1	.00128	.78	.019	.27917	1.532	.949	RAIN24=	1.830
FINISH										PER IMP=	.00

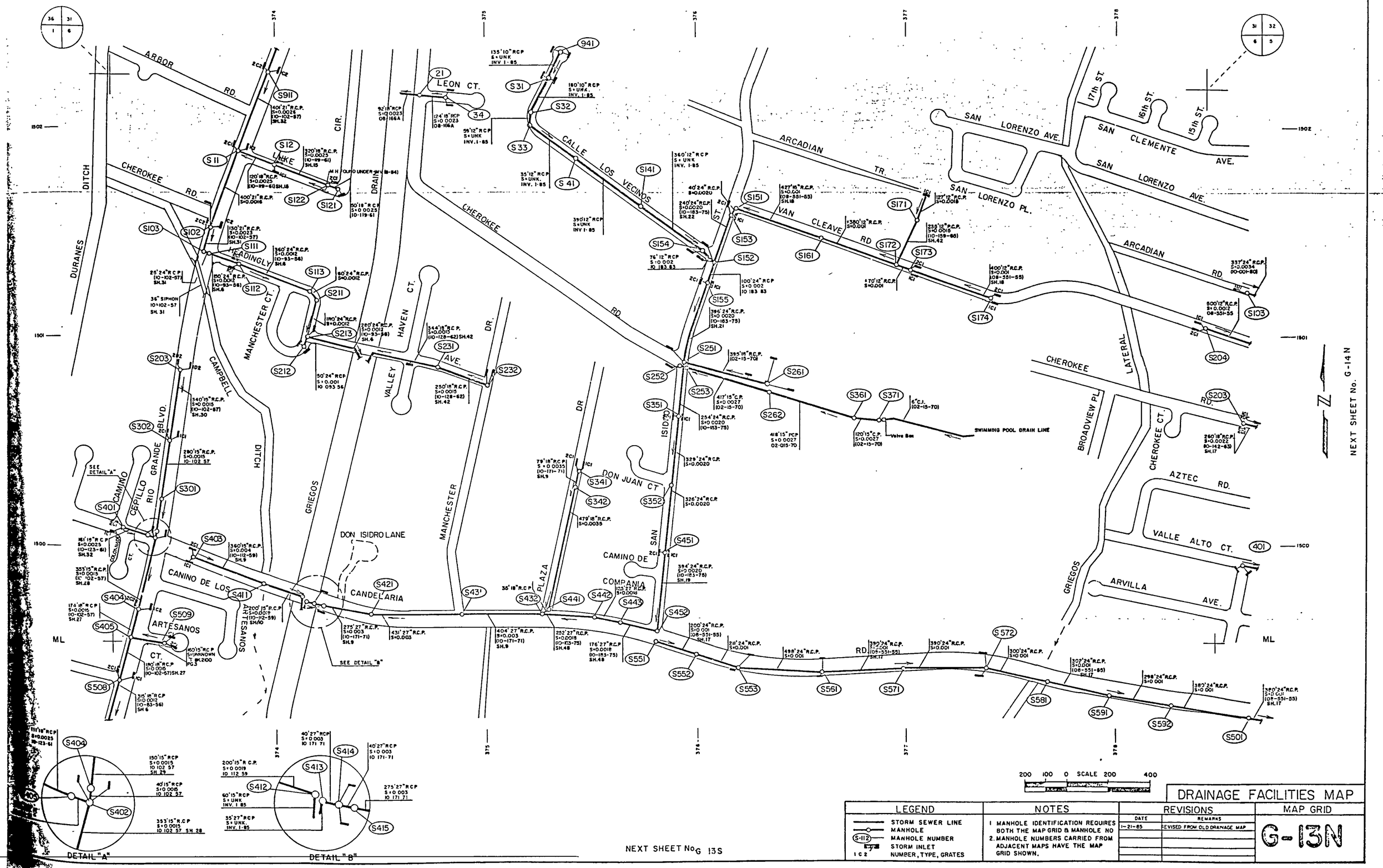
```
*****************************************************************
*                          VAN CLEAVE                           *
*****************************************************************
*       100-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS)      *
*****************************************************************
*
START                TIME=0.0
*
* BASIN 1
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.02253 HR
COMPUTE NM HYD       ID=1 HYD NO=100.1 AREA=0.000433 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
* BASIN 2
*
COMPUTE NM HYD       ID=1 HYD NO=100.1 AREA=0.000427 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
* BASIN 3
*
COMPUTE NM HYD       ID=1 HYD NO=100.1 AREA=0.000421 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
*****************************************************************
*       10-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS)       *
*****************************************************************
*
START                TIME=0.0
*
* BASIN 1
*
RAINFALL             TYPE=2 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                     RAIN DAY=1.83 IN DT=0.02253 HR
COMPUTE NM HYD       ID=1 HYD NO=110.1 AREA=0.000433 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
* BASIN 2
*
COMPUTE NM HYD       ID=1 HYD NO=110.1 AREA=0.000427 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*
* BASIN 3
*
COMPUTE NM HYD       ID=1 HYD NO=110.1 AREA=0.000421 SQ MI
                     PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                     TP=-0.1333 HR MASS RAINFALL=-1
```

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

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =10/21/1996

INPUT FILE = A:P.DAT USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION	
START											
RAINFALL TYPE= 2										TIME=	.00
										RAIN24=	2.750
COMPUTE NM HYD	100.10	-	1	.00043	1.26	.050	2.16393	1.510	4.554	PER IMP=	90.00
COMPUTE NM HYD	100.10	-	1	.00043	1.24	.049	2.16392	1.510	4.554	PER IMP=	90.00
COMPUTE NM HYD	100.10	-	1	.00042	1.23	.049	2.16392	1.510	4.554	PER IMP=	90.00
START											
RAINFALL TYPE= 2										TIME=	.00
										RAIN24=	1.830
COMPUTE NM HYD	110.10	-	1	.00043	.82	.031	1.35014	1.510	2.942	PER IMP=	90.00
COMPUTE NM HYD	110.10	-	1	.00043	.80	.031	1.35014	1.510	2.942	PER IMP=	90.00
COMPUTE NM HYD	110.10	-	1	.00042	.79	.030	1.35014	1.510	2.942	PER IMP=	90.00
FINISH											



DRAINAGE FACILITIES MAP

LEGEND	NOTES	REVISIONS		MAP GRID
STORM SEWER LINE MANHOLE (S-112) MANHOLE NUMBER STORM INLET 1 C 2 NUMBER, TYPE, GRATES	1. MANHOLE IDENTIFICATION REQUIRES BOTH THE MAP GRID & MANHOLE NO 2. MANHOLE NUMBERS CARRIED FROM ADJACENT MAPS HAVE THE MAP GRID SHOWN.	DATE	REMARKS	G-13N
		1-21-85	REVISED FROM OLD DRAINAGE MAP	