

DRAINAGE INFORMATION SHEET

PROJECT TITLE: KIVA WEST OF SAN ILDEFONSO ZONE ATLAS/DRNG. FILE #: E-11 / 527

LEGAL DESCRIPTION: VOLCANO CLIFFS SUBDIVISION BLOCK 1, LOTS 3,4,5,6,8, 9, 10, 11A.

CITY ADDRESS: NORTH SIDE OF MONTANO RD. BETWEEN MONTANO AND KIVA ST.

ENGINEERING FIRM: Community Sciences Corporation CONTACT: STEPHEN L. CRAWFORD, P.E.

ADDRESS: P.O. Box 1328, Corrales, N. M. 87048 PHONE: 897-0000

OWNER: DNV CONSTRUCTION CONTACT: DICK NASSIF

ADDRESS: 10224 CALLE HIDALGO NW PHONE: 898-7247

ARCHITECT: N/A CONTACT: N/A

ADDRESS: N/A PHONE: N/A

SURVEYOR: Community Sciences Corporation CONTACT: CLIFF A. SPIROCK, L.S.

ADDRESS: P.O. BOX 1328 CORRALES, NM PHONE: 891-1400

CONTRACTOR: N/A CONTACT: N/A

ADDRESS: N/A PHONE: N/A

PRE-DESIGN MEETING:

☒ YES

DRB NO. 93-357

☐ NO

EPC NO. _____

☒ COPY OF CONFERENCE RECAP SHEET PROVIDED PROJ. NO. _____

TYPE OF SUBMITTAL:

CHECK TYPE OF APPROVAL SOUGHT:

☒ DRAINAGE REPORT

☐ SKETCH PLAT APPROVAL

☐ DRAINAGE PLAN

☒ PRELIMINARY PLAT APPROVAL

☒ CONCEPTUAL GRADING AND DRAINAGE PLAN

☐ SITE DEVELOPMENT PLAN APPROVAL

☐ GRADING PLAN

☐ FINAL PLAT APPROVAL

☒ EROSION CONTROL PLAN

☐ BUILDING PERMIT APPROVAL

☐ ENGINEER'S CERTIFICATION

☐ FOUNDATION PERMIT APPROVAL

☐ CERTIFICATE OF OCCUPANCY APPROVAL

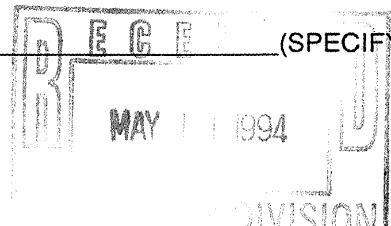
☐ ROUGH GRADING PERMIT APPROVAL

☐ GRADING/PAVING PERMIT APPROVAL

DATE SUBMITTED: _____

☐ OTHER _____ (SPECIFY)

BY: _____





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 20, 1996

Richard Hall
Hall Engineering
6840 2nd St. NW
Albuquerque, NM 87107

RE: ENGINEER CERTIFICATION FOR FINANCIAL GUARANTEE RELEASE
ON SUN TERRACE ESTATES 4975.90 (E11-D27) CERTIFICATION STATEMENT
DATED 3/14/96.

Dear Mr. Hall:

Based on the information provided on your March 18, 1996 submittal, Engineer Certification for the above referenced site is acceptable for Financial Guarantee release.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya, CE
Engineering Associate

BJM/dl

c: Andrew Garcia
Lyle Melyn
Theresa Lucero
File



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 24, 1994

Stephen L. Crawford, P.E.
Community Sciences Corp
P.O. Box 1328
Corrales, N.M. 87048

RE: DRAINAGE REPORT FOR KIVA WEST OF SAN ILDEFONSO (E-11/D27)
RECEIVED MAY 11, 1994 FOR PRELIMINARY PLAT APPROVAL
ENGINEER'S STAMP DATED 5-9-94

Dear Mr. Crawford:

Based on the information included in the submittal referenced above, City Hydrology approves this project for Preliminary Plat.

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

WPHYD/8545/jpc

I. PURPOSE AND SCOPE

DNV Construction is currently planning for the development of Kiva West of San Ildefonso. The proposed development consists of approximately 4.34 acres and is to be subdivided into 34 single family/townhouse residences.

This report presents an overall Drainage Management and Conceptual Grading Plan for approval by the City of Albuquerque in order that subsequent subdivision and development may commence.

II. SITE DESCRIPTION AND HISTORY

Kiva West of San Ildefonso is a replat of Volcano Cliffs Subdivision Block 1, Lots 3, 4, 5, 6, 8, 9, 10, 11A. It is located on the north side of Montano Road between Montano Road and Kiva St. and west of San Ildefonso (see Vicinity Map on Preliminary Grading Plan in Pocket 1).

The site slopes to the east at an approximate average slope of 1%. No flood plains or arroyos exist through this site. The soil is classified by the Soil Conservation Service as "Madurez" a fine loamy sand that is considered in the "Type A" hydraulic soils group (see Soil Survey Map Appendix C).

Previous studies were conducted in SAD 197, and in SAD 219 for portions of the site. Both were considered under fully developed conditions using the existing Volcano Cliffs platting and development densities.

III. DESIGN CRITERIA

A. Flood Control Regulations

The drainage plan presented in this report has been designed to comply with AMAFCA resolution 80-15, which requires that proposed land development projects be designed such that no flooding of private properties will occur during any storm up to and including the 100-year frequency event. Additionally, this drainage plan has been designed to comply with current "City of Albuquerque Drainage Ordinance" and Chapter 22 of the Development Process Manual (DPM), and subsequently adopted general policies of the City of Albuquerque.

1. 100-year storm
 - a. Stormwater flow depth not to exceed the top of curb in any street.
 - b. Jump depth to be contained within right-of-way.
2. 10-year storm:
 - a. Local street - velocity times depth less than 6.5
 - b. Arterial streets:
 - i. Flow not to exceed a depth of 0.50
 - ii. Velocity times depth less than 6.5
 - iii. One driving lane in each direction free of stormwater

B. Engineering Parameters

In accordance with AMAFCA criteria, all hydrological analysis is based on the 100-year frequency, 6-hour duration storm, as represented in Section 22.2, Hydrology, of the "Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993".

Ten-year, 6-hour values were also used for subcatchments, in accordance with City drainage policies regarding street flow.

The four rainfalls pertinent to the study are as follows:

	<u>10-Year</u>	<u>100-Year</u>
One-Hour	<u>1.26"</u>	<u>1.89"</u>
Six-Hour	<u>1.50 "</u>	<u>2.25"</u>

IV. COMPUTATIONAL PROCEDURES

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

Hydrological computations were accomplished by methods from Section 22.2, Hydrology of Development Process Manual, January 1993. The input parameters and resulting flows for the basins are summarized on Table 1, calculations are presented in Appendix A.

Times of concentration were estimated using the Upland Method and then converted to times to peak (Lg), in accordance with the above referenced Section 22.2 which also establishes the minimum time of concentration as 12 minutes.

Flow characteristics for conveyance swales, channels, and streets were analyzed based on the Manning equation for uniform flow. Streets are assumed to have a 2% cross slope from lip of gutter to crown and a curb and gutter per City of Albuquerque Standard details. Finished grade at the right-of-way is 0.33' above top of curb.

V. OFF-SITE DRAINAGE

There is no off-site drainage tributary to this subdivision.

VI. ON-SITE DRAINAGE

Calculations for Montano Road using intersection flows from (SAD 197) Appendix C, show that there is no capacity for surface drainage to Montano, when considering 1 free driving lane at the 10-year storm. Basins 1-A, 1-B, 2-A and 2-B will drain into the existing 48" storm line in Montano Road via the proposed drainage inlets and storm lines. The emergency overflows will be implemented by using the water blocks on the courts as a weir flowing water to Kiva Street. If emergency overflow is required at no time will water elevations in the street exceed the right-of-way line for 100 year conditions. Basins 1-C and 2-C will flow in their historical direction, flowing into Kiva Street, then to San Ildefonso Drive, drainage into existing inlets on the 48" Montano Road storm drain.

Surface drainage into Montano Road and Kiva Street will be reduced by re-routing water through proposed inlets and storm drains, reduction to be $Q_{100} = 8.23$ CFS, in Montano and $Q_{100} = 5.3$ CFS in Kiva.

The total increase flowing into the Montano Road 48" storm drain will $Q_{100} = 3.7$ CFS. In the "SAD 217" Drainage Report (see Appendix C) it is stated that at San Ildefonso and Montano there is 143 CFS allowable capacity in the 48" storm drain. Currently, only 137 CFS is being discharged into the Montano storm drain system at this point, leaving 6.0 CFS available. This will allow for free discharge for our additional 3.7 CFS (caused by the increase in development density from the existing Volcano Cliffs platting to our proposed subdivision concept).

VII. EROSION CONTROL

Control of excessive soil erosion into City streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. The Preliminary Grading and Drainage Plan in Pocket 1 illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to City rights-of-way or public easements.

TABLE I

EXISTING DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T _c (Min.)	A	B	C	D	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
1	.00302	1	.00302	12	0	0	100	0	5.55	2.88	5.55	2.88
2	.00376	2	.00376	12	0	0	100	0	6.90	3.58	6.90	3.58

FUTURE DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T _c (Min.)	A	B	C	D	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
1A	.00187	1A	.00187	12	0	15	15	70	4.55	2.83	4.55	2.83
1B	.00100	1B	.00100	12	0	15	15	70	2.44	1.52	2.44	1.52
1C	.00015	1C	.00015	12	0	15	15	70	.35	.22	.35	.22
2A	.00253	2A	.00253	12	0	15	15	70	6.15	3.83	6.15	3.83
2B	.00095	2B	.00095	12	0	15	15	70	2.31	1.43	2.31	1.43
2C	.00015	2C	.00015	12	0	15	15	70	.35	.22	.35	.22

TABLE 2
FLOW CHARACTERISTICS AT KEY LOCATIONS

STREET	LOCATION	ST. WIDTH	% SLOPE	Q100	Q10	Dn	Dc	Vn	Vc	AREA	TOP WIDTH	EG	F	*POOL DEPTH
CARDIGAN CT	SUMP	25 MOUNT	0.50	8.46	---	0.32	0.30	1.89	2.21	4.47	26.20	0.38	0.81	---
MONTANO RD ++	BLOCK A ESMT	1 LANE	0.74	---	53.00	0.95	1.03	5.78	5.23	9.17	12.17	1.47	1.17	1.56

* POOL DEPTH = $D_c + (1.25V^2)/2g$

++ UNDER EXISTING CONDITIONS MONTANO ROAD EXCEEDS NUMEROUS DPM CRITERIA INCLUDING 10 YEAR CAPACITY FOR ONE LANE FREE TRAVEL. THEREFORE, ADDITIONAL SURFACE DRAINAGE INTO MONTANO IS NOT PERMITTED, AND THIS REPORT WAS PREPARED ACCORDINGLY.

EXISTING CONDITIONS

ASSUME ALL TYPE C LAND CONDITIONS

BASIN 1 1.93 AC

$$Q_{100} = 1.93 (2.37) = 5.55 \text{ cfs}$$

$$Q_{10} = 1.93 (1.49) = 2.88 \text{ cfs}$$

BASIN 2 2.41 AC

$$Q_{100} = 2.41 (2.37) = 5.90 \text{ cfs}$$

$$Q_{10} = 2.41 (1.49) = 3.58 \text{ cfs}$$

PROPOSED CONDITIONS

LAND TREATMENTS

TYPE D MULTIPLE UNIT RESIDENTIAL ATTACHED 70%
TYPE B 15%
TYPE C 15%

$$E_{100} = .7(4.37) + .15(2.03) + .15(2.87) = 3.794$$

$$E_{10} = .7(2.39) + .15(.76) + .15(1.49) = 2.36$$

BASIN	AREA (AC)	Q_{100}	Q_{10}
1A	1.198	4.55	2.83
1B	.643	2.44	1.52
1C	.093	.35	.22
2A	1.621	6.15	3.83
2B	.608	2.31	1.43
2C	.093	.35	.22

INLET CALCUTATIONS

CARDIGAN COURT

TYPE DOUBLE A DOUBLE GRATE SINGLE THROAT

$$Q_{ORIFACE} = .65 \times A \sqrt{2gh}$$

$$Q_{100} = 8.46 \text{ CFS} \quad \text{GRATE AREA } 4.10 \text{ SF} \times 2 = 8.2 \text{ SF}$$

$$\text{ASSUME 40\% CLOGGING} \quad 8.2 \times .6 = 4.92 \text{ SF}$$

$$8.46 = .65 \times 4.92 \sqrt{2(32.2)h}$$

$$h = .109'$$

NASSIF COURT

TYPE DOUBLE A SINGLE GRATE

$$Q_{100} = 6.99 \quad \text{GRATE AREA } 4.10 \text{ SF}$$

$$\text{ASSUME 40\% CLOGGING} \quad 4.10 \times .6 = 2.46 \text{ SF}$$

$$6.99 = .65 \times 2.46 \sqrt{2(32.2)h}$$

$$h = .297'$$

IN BOTH COURTS BY TRANSFERRING TO ROLL CURB CUTTER IMMEDIATELY AFTER THE INLET, WILL NOT BE EXCEEDED BY THE HEIGHT OF HEAD

EMERGENCY OVERFLOW VIA WIER FLOW OVER WATER BLOCK TO CURB

$$Q_{100} = 2.65 (L) h^{1.5}$$

$$8.46 = 2.65 (26) h^{1.5}$$

$$h = .254$$

IN NO CASE DOES THE WATER BLOCK HEIGHT PLUS THE HEAD HEIGHT THRU THE WIER EXCEED ANY R.O.W. LINE ELEVATION

24" RCP stubout on Kiva approximately 200 feet east of Pojoaque. The capacity of this 24" pipe will be about 13 cfs. The calculated cumulative peak flow rate at the intersection of Kiva Street with San Ildefonso is 97 cfs.

Adjusting for the flows to be collected upstream on Kiva, there still remains 83 cfs surface flow at the Kiva/San Ildefonso intersection. This would cause the 100 year runoff to be approximately 0.2' above the top of the curb on San Ildefonso from Kiva south about 250 feet to the existing drop inlets on San Ildefonso at Montano. The proposed 100 year discharge from SAD 219 will be within the allowances of the SAD 197 report and within the capacity of the existing 48" storm sewer on Montano. It would also be required to utilize the existing 25' wide public drainage easement, and construct a relatively small (6' wide x 1' deep) concrete rectangular channel to intercept approximately 14 cfs on Kiva just east of Pojoaque, and carry the flows directly to Montano.

Kachina Street Outfall (see Sheet 1 of 9, Drainage Map E-11)

SAD 219 Drainage Area E11-3 is proposed to discharge across San Ildefonso east to Kachina Street. Research into the Butterfield Subdivision Drainage Report revealed that an allowance of 32 cfs offsite flows from the west across San Ildefonso was anticipated and taken into account for design purposes. However, due to changes during construction, Kachina Street was not constructed to carry these flows. This study resulted in a developed discharge rate of 12 cfs for the 100 year storm. The discharge rate onto Kachina Street east of San Ildefonso is within the limits of the design of existing Kachina as established by a hydraulic analysis of the capacity of Kachina Street as constructed, having a capacity of approximately 15 cfs.

B. Summary

The proposed public improvements for SAD 219 and the resulting private development thereafter will drain in conformance with and within the limits of previously accepted drainage plans assuming no future density changes or zone changes. The four major outfalls for the Volcano Cliffs Area of SAD 219 are the Mariposa North Channel, the Boca Negra Arroyo, Montano Road (SAD 197), and Kachina Street east of San Ildefonso. The table on the following page summarizes the proposed conditions for each of the basins in this area.

hydrograph peaks." Therefore, it is proposed that the assigned flowrate/acre criteria as outlined on page 25 of the FNDMP not be applied to this area of SAD 219 because the entire SAD 219 area is at the extreme lower reaches of the watershed. Direct discharge into the Boca Negra Arroyo and the Mariposa North Channel will be acceptable.

Montano Outfall (see Sheet 1 of 3, Drainage Maps D-10, D-11, E-10, and E-11)

Portions of the SAD 219 Volcano Cliffs Area will discharge into Montano Road which was designed and constructed under SAD 197. The SAD 197 drainage areas that correspond with improvements proposed in SAD 219 are Drainage Areas 3, 4, 5, and 6. A summary of these drainage areas and their associated runoff rates are summarized in the following table:

Drainage Area Designation	Area (acres)	Q10 (cfs)	Q100 (cfs)
3	26	46	70
4	7	12	19
5	7	12	19
6	<u>45</u>	<u>80</u>	<u>121</u>
Total	59	150	229
Totals for Areas 1 thru 7		224	341

The SAD 197 Drainage Report allots 150 cfs peak flows for the 10 year storm and 229 cfs peak flows for the 100 year storm for Areas 3, 4, 5, and 6 combined. The Report utilizes calculations based on the Rational Method utilizing a C value of 0.58. By redefining the drainage areas somewhat during the design of SAD 219 and utilizing a C Factor of 0.60 to calculate the flows, the runoff from those areas was reduced to 91 cfs for the 10 year storm, and 137 cfs for the 100 year storm. At the catch basin located on San Ildefonso at Montano, the capacity of the 48" storm sewer pipe is 143 cfs as shown on Sheet 32 of 35 of the record drawings of SAD 197 (City Drawing No. 1635). However, the street capacities of Kiva Street and of San Ildefonso are limited to approximately 50 cfs each. In order to accommodate the excess runoff for this street, it is proposed to construct drop inlets on the end of the existing

SAD

1987

Mantano Road

Scamant & Assoc. E Flows10 year
(CFS)100 year
(CFS)

① Vista Mantano

172

262

② West Property line of Vista Mantano
(Easement thru Butterfield I)

163

248

③ San Ildefonso Drive

138

210

④ Golden Ave

106

161

⑤ Between Golden^{Ave} & Whiteman Drive

95

145

⑥ Whiteman Drive

84

128

Completely developed condition
using Rational method, $T_c = 10$ min for
each area, .58 C coefficient, Routing
flows down Mantano to change T_c for
routed flows @ 6 ft/sec

Flows
10 year

100 year

1 21

32

2 49

75

3 46

70

4 12

19

5 12

19

6 80

121

7 4

5

Total 224

341



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 27, 1994

Stephen L. Crawford, P.E.
Community Sciences Corp
P.O. Box 1328
Corrales, N.M. 87048

RE: DRAINAGE REPORT FOR KIVA WEST OF SAN ILDEFONSO (E-11/D27)
RECEIVED JUNE 20, 1994 FOR ROUGH GRADING PERMIT APPROVAL
ENGINEER'S STAMP DATED 6-17-94

Dear Mr. Crawford:

Based on the information included in the submittal referenced above, City Hydrology approves this project for Rough Grading Permit.

The Contractor must obtain a "Topsoil Disturbance Permit" from the Environmental Health Department prior to any grading.

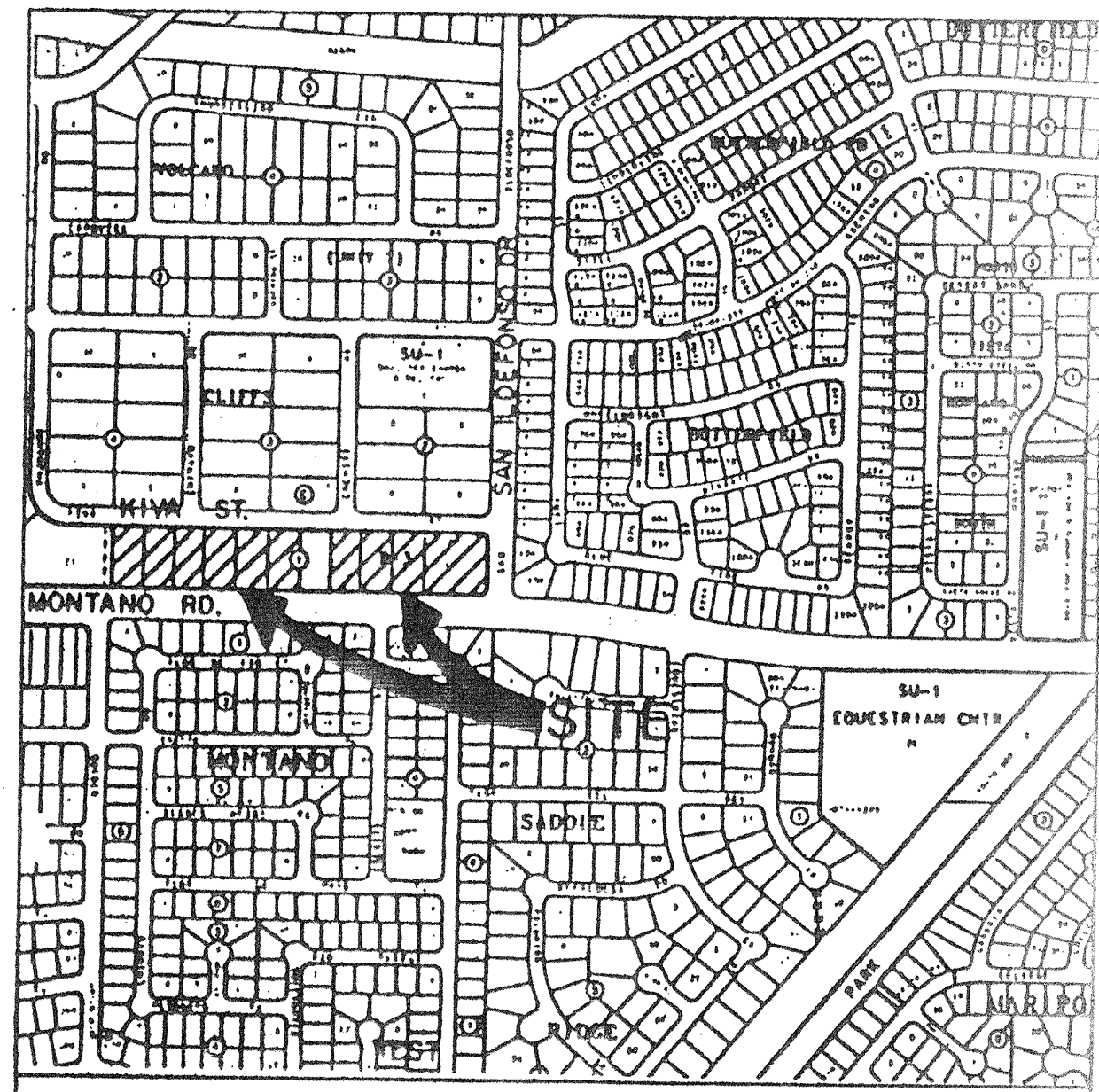
If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

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

c: Andrew Garcia

WPHYD/8545/jpc



E-11-Z

N O T E

LEGEND	
	PROPOSED TOP OF CURB ELEVATION
	PROPOSED SPOT ELEVATION
	EXISTING SPOT ELEVATION (GRND & C)
	EROSION CONTROL BERM
	PROPOSED CONCRETE VALLEY CUTTER
	EXISTING CURB & GUTTER
	PROPOSED MOUNTABLE CURB & GUTTER
	PROPOSED STANDARD CURB & GUTTER
	EXISTING CONTOUR w/ INDEX ELEVATION
	SWALE
	FLOW ARROW
	PROPOSED RETAINING WALL

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER
DRC CHAIRMAN			WATER	
TRANSPORTATION			WASTE WATER	
HYDROLOGY			A.M.A.F. C.A.	
PROJECT NO.		MAP NO.	SHEET OF	
		E-11	3	

NO.	DATE	REMARKS
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RECEIVED
MAR 18 1996
HYDROLOGY