

CITY OF ALBUQUERQUE



February 16, 2012

Daniel S. Aguirre, P.E.
Wilson & Company, Inc.
4900 Lang Ave. NE
Albuquerque, NM 87109

Re: Volcano Heights Drainage Compilation Report, Engineer's Stamp
Dated 12-12-2011 (C10/D000)

Dear Mr. Aguirre,

Based upon the information provided in your submittal received 12-12-11, the above referenced report is approved based on the following comments:

- The Trails may build a storm drain south on Universe Blvd. to the Boca Negra Dam.
- The Trails may be allowed a discharge in excess of 80 cfs.

If you have any questions, you can contact me at 924-3986.

PO Box 1293
Albuquerque

NM 87103

www.cabq.gov

Sincerely,

Curtis Cherne, P.E.
Principal Engineer, Planning Dept.
Development and Building Services

C: File , e-mail

CITY OF ALBUQUERQUE



December 30, 2011

Daniel S. Aguirre, P.E.
Wilson & Company, Inc.
4900 Lang Ave. NE
Albuquerque, NM 87109

Re: Volcano Heights Drainage Compilation Report, Engineer's Stamp
Dated 12-12-2011 (C10/D000)

Dear Mr. Aguirre,

Based upon the information provided in your submittal received 12-12-11, the above referenced report is approved based on the following comments:

PO Box 1293

Albuquerque

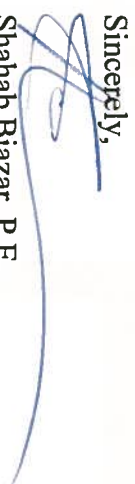
- Proposed discharge from Pond 2 is 470 cfs, and the total discharge from other Basins (4A, 4B, PDN2...) is 252 cfs. Therefore, the total discharge from these two locations is 722 cfs which exceeds the 620 cfs at AP1. The discharges from Basins 7, 12B, and A may have to be controlled discharges to meet the 620 cfs.
- Please see enclosed copy of the comments for SAD 228.

NM 87103

If you have any questions, you can contact me at 924-3695.

www.cabq.gov

Sincerely,


Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: File

To: Shahab Biazar, P.E.
Development and Building Services
City of Albuquerque

From: Daniel S. Aguirre, P.E.

Date: October 24, 2011

File Number: X3-210-022

Re: **Volcano Heights Drainage Compilation Report**

Dear Mr. Biazar,

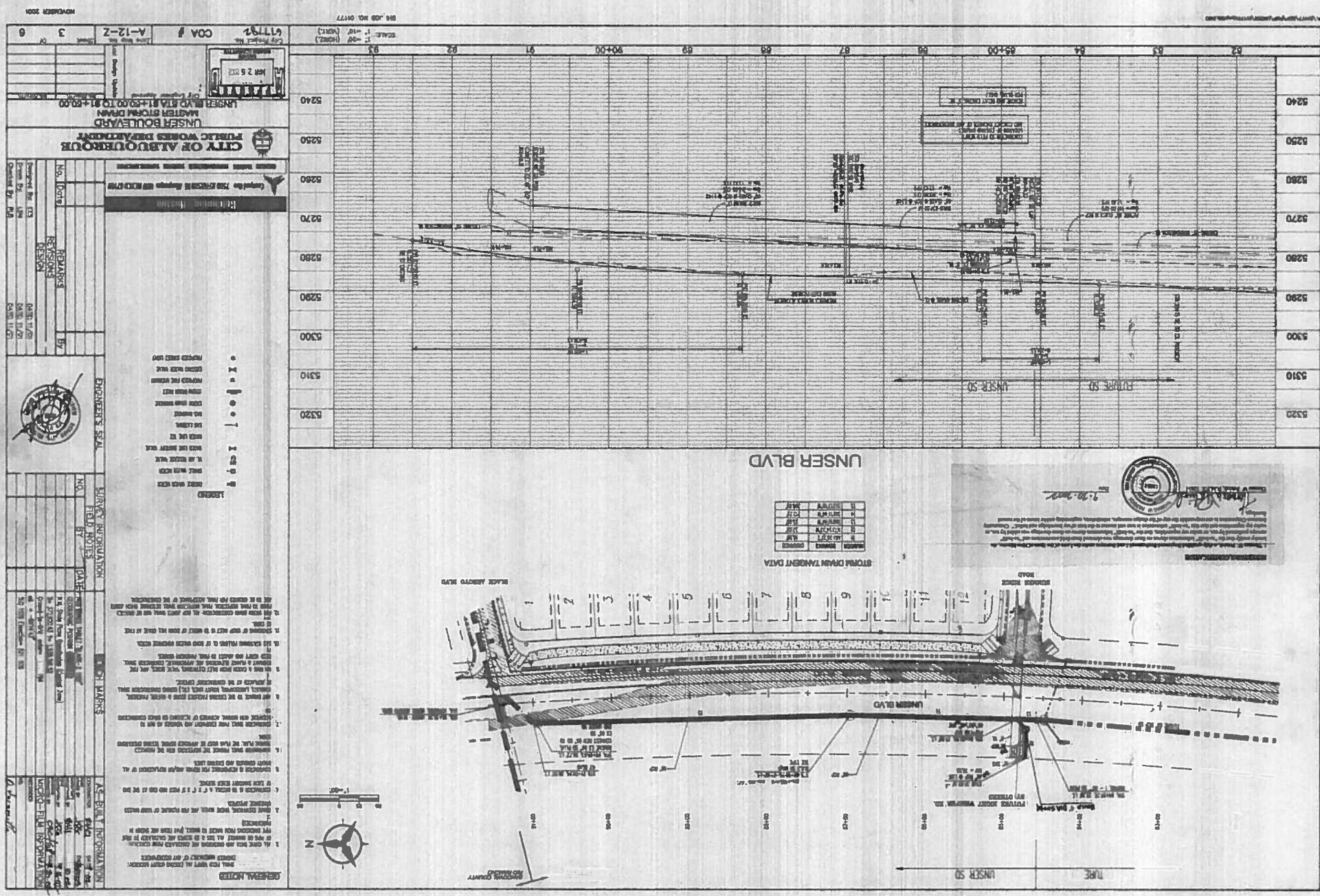
The intent of this report is to share with the City and AMAFCA the planning concepts used over the past 8-10 years in this area and to bring to your attention the system limitations based on the existing and planned infrastructure. This report is not intended to be used for design but to identify the allowable discharge at specific points in the area based on the concepts followed with past projects. I have updated the report per your comments to fix any identified errors and tried to explain the intent below. Please remember that any projects in the area require a detailed analysis and do not need to follow the exact concepts used for the purposes of this report.

Please see below responses to your comments of the review of the drainage report dated August 24, 2011:

1. **Any discharge to the Petroglyph National Monument has to be approved by Open Space.** This report is based on several approved reports that have been completed over the pasted several years. These flows have been approved via the Paseo Del Norte Extension drainage report, La Cuentista Subdivision, Vista Vieja Subdivision and Boca Negra Dam plus others. An additional meeting was held with Open Space on October 17, 2011 to discuss all discharges into open space. The Map has been slightly modified based on this meeting in the SAD 228 area and a copy of a letter of approval will be sent to your office when received from Open Space.
2. **Please confirm the allowable discharge from Pond 11 to Chamisa storm drain system.** AMAFCA required that the Chamisa Storm Drain take the 45 cfs from adjacent lots. The flow is shown in the approved drainage report for the Paseo Del Norte Extension and should be included in the Chamisa storm drain report.



3. **How was the capacity determined to allow the Unser Detention Basin to drain to Chamisa Detention Basin?** This is a proposed system (concept only) to prevent low flows from discharging to the Petroglyph National Monument (PETR) during low flow (erosive) events. We created a pond to store water with a minimal discharge to the Chamisa detention basin ultimately discharging to the Lyon Blvd storm drain for low flows (up to 10 year event) once the pond fills to the 10 year volume it will start to spill to PETR through a weir up to the 120 cfs originally identified as historic flow. This was intended to reduce erosion at the PETR discharge point and can be redesigned and modified with a more detailed analysis or other concepts when final design is completed.
4. **Can some of the flows proposed for Unser Detention Basin drain south to the Paseo Del Norte Storm Drain System?** The existing Paseo Del Norte Storm Drain System was designed and constructed based on the roadway original alignment. The existing storm drain system has a limited capacity and would require additional ponds to accept flows from other subbasins. If you incorporate the right amount of detention you can modify in final design plans.
5. **May need to run the runoff calculations based on the 100-year, 24-hour storm based on the duration of the discharge for the detention ponds. Please stay consistent between all the drainage reports for this area. Most of the runoff calculations for the SAD 228 where based on the 100-year, 24-hour storm.** This report serves as a guide to develop allowable flows at specific discharge points. Hydrology calculations need to be modeled in future studies as each area is developed in the same manner that has been done with SAD 228. The final models will be determined based on the requirements for the design.
6. **Flow numbers for Basins K2, M5, M6, and T1 are not the same on the Plate-1, Table-1/Plate-1 and AHYMO calculations. T1 basin area is different from the AHYMO calculations and what is shown on the Plate-1.** All numbers corrected.



Engineering title block containing project information, city of Albuquerque logo, and various administrative fields.

CITY OF ALBUQUERQUE
UNSER BLVD
STREET DRAIN TANGENT DATA

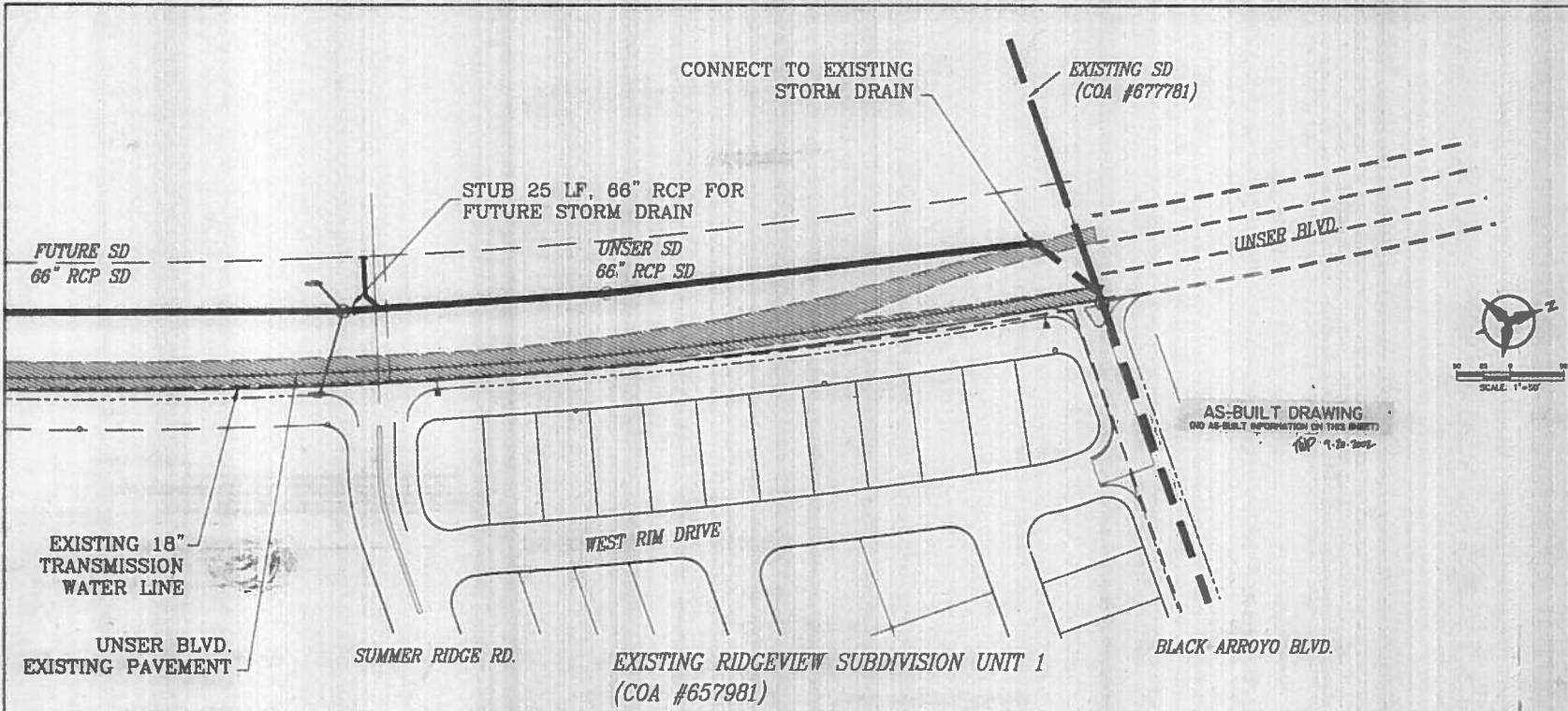
PROJECT INFORMATION

NO.	DATE	BY	CHKD.
1	10/1/00	J. J. J.	J. J. J.
2	10/1/00	J. J. J.	J. J. J.
3	10/1/00	J. J. J.	J. J. J.
4	10/1/00	J. J. J.	J. J. J.
5	10/1/00	J. J. J.	J. J. J.
6	10/1/00	J. J. J.	J. J. J.
7	10/1/00	J. J. J.	J. J. J.
8	10/1/00	J. J. J.	J. J. J.
9	10/1/00	J. J. J.	J. J. J.
10	10/1/00	J. J. J.	J. J. J.

ENGINEER'S SEAL

LEGEND

- 1. 1" = 100'
- 2. 1" = 100'
- 3. 1" = 100'
- 4. 1" = 100'
- 5. 1" = 100'
- 6. 1" = 100'
- 7. 1" = 100'
- 8. 1" = 100'
- 9. 1" = 100'
- 10. 1" = 100'



AS-BUILT DRAWING
(NO AS-BUILT INFORMATION ON THIS SHEET)
10/17/01

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES.
2. ALL CURB AND GUTTER ELEVATIONS ARE CALCULATED FROM CORNER OF PAVEMENT OR CURB. ALL 12\"/>

- LEGEND**
- 12\"/>

City of Albuquerque
Public Works Department
UNSER BOULEVARD
MASTER STORM DRAIN
OVERALL UTILITY PLAN

City Project No.	Zone Map No.	Sheet	Of
677751	COA # A-12-Z	2	6

DATE	BY	REVISION
10/17/01	W. J. [Signature]	1.0
10/17/01	W. J. [Signature]	1.1
10/17/01	W. J. [Signature]	1.2
10/17/01	W. J. [Signature]	1.3
10/17/01	W. J. [Signature]	1.4
10/17/01	W. J. [Signature]	1.5
10/17/01	W. J. [Signature]	1.6
10/17/01	W. J. [Signature]	1.7
10/17/01	W. J. [Signature]	1.8
10/17/01	W. J. [Signature]	1.9
10/17/01	W. J. [Signature]	2.0

CITY OF ALBUQUERQUE



August 24, 2011

Daniel S. Aguirre, P.E.
Wilson & Company, Inc.
4900 Lang Ave. NE
Albuquerque, NM 87109

Re: Volcano Heights Drainage Compilation Report, Engineer's Stamp
Dated 7-5-2011 (C10/D000)

Dear Mr. Aguirre,

Based upon the information provided in your submittal received 7-6-11, the above referenced report cannot be approved until the following comments are addressed:

- Any discharge to the Petroglyph National Monument has to be approved by Open Space.
 - Please confirm the allowable discharge from Pond 11 to Chamisa Strom drain system.
 - How was the capacity determined to allow the Unser Detention Basin to drain to Chamisa Detention Basin.
 - Can some of the flows proposed for Unser Detention Basin drain south to the Paseo Del Norte Storm Drain system?
 - May need to run the runoff calculations based on the 100-year/24-hour storm based on the duration of the discharge for the detention ponds. Please stay consistent between all the drainage reports for this area. Most of the runoff calculations for the SAD 228 where based on the 100-year/24-hour storm.
 - Flow number for Basins K2, M5, M6, and T1 are not the same on the Plate-1, Table-1/Plate-1 and AHYMO calculations. T1 basin area is different from the AHYMO calculations and what is shown on the Table-1/Plate-1.
- NM 87103
- www.cabq.gov

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: File

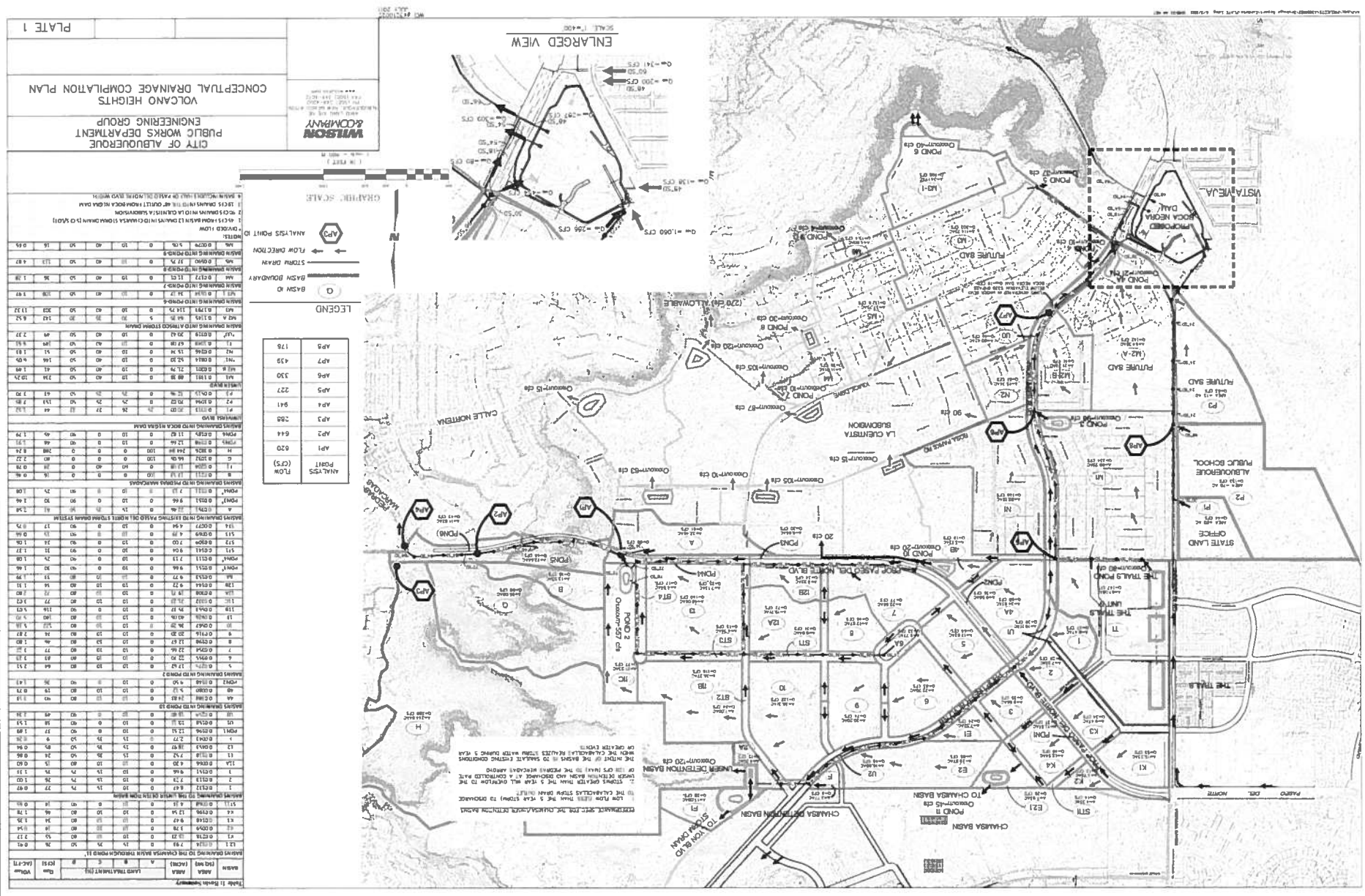


Table 1: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 1	100	1000	10	10
Basin 2	200	2000	20	20
Basin 3	300	3000	30	30
Basin 4	400	4000	40	40
Basin 5	500	5000	50	50
Basin 6	600	6000	60	60
Basin 7	700	7000	70	70
Basin 8	800	8000	80	80
Basin 9	900	9000	90	90
Basin 10	1000	10000	100	100

Table 2: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 11	1100	11000	110	110
Basin 12	1200	12000	120	120
Basin 13	1300	13000	130	130
Basin 14	1400	14000	140	140
Basin 15	1500	15000	150	150
Basin 16	1600	16000	160	160
Basin 17	1700	17000	170	170
Basin 18	1800	18000	180	180
Basin 19	1900	19000	190	190
Basin 20	2000	20000	200	200

Table 3: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 21	2100	21000	210	210
Basin 22	2200	22000	220	220
Basin 23	2300	23000	230	230
Basin 24	2400	24000	240	240
Basin 25	2500	25000	250	250
Basin 26	2600	26000	260	260
Basin 27	2700	27000	270	270
Basin 28	2800	28000	280	280
Basin 29	2900	29000	290	290
Basin 30	3000	30000	300	300

Table 4: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 31	3100	31000	310	310
Basin 32	3200	32000	320	320
Basin 33	3300	33000	330	330
Basin 34	3400	34000	340	340
Basin 35	3500	35000	350	350
Basin 36	3600	36000	360	360
Basin 37	3700	37000	370	370
Basin 38	3800	38000	380	380
Basin 39	3900	39000	390	390
Basin 40	4000	40000	400	400

Table 5: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 41	4100	41000	410	410
Basin 42	4200	42000	420	420
Basin 43	4300	43000	430	430
Basin 44	4400	44000	440	440
Basin 45	4500	45000	450	450
Basin 46	4600	46000	460	460
Basin 47	4700	47000	470	470
Basin 48	4800	48000	480	480
Basin 49	4900	49000	490	490
Basin 50	5000	50000	500	500

Table 6: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 51	5100	51000	510	510
Basin 52	5200	52000	520	520
Basin 53	5300	53000	530	530
Basin 54	5400	54000	540	540
Basin 55	5500	55000	550	550
Basin 56	5600	56000	560	560
Basin 57	5700	57000	570	570
Basin 58	5800	58000	580	580
Basin 59	5900	59000	590	590
Basin 60	6000	60000	600	600

Table 7: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 61	6100	61000	610	610
Basin 62	6200	62000	620	620
Basin 63	6300	63000	630	630
Basin 64	6400	64000	640	640
Basin 65	6500	65000	650	650
Basin 66	6600	66000	660	660
Basin 67	6700	67000	670	670
Basin 68	6800	68000	680	680
Basin 69	6900	69000	690	690
Basin 70	7000	70000	700	700

Table 8: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 71	7100	71000	710	710
Basin 72	7200	72000	720	720
Basin 73	7300	73000	730	730
Basin 74	7400	74000	740	740
Basin 75	7500	75000	750	750
Basin 76	7600	76000	760	760
Basin 77	7700	77000	770	770
Basin 78	7800	78000	780	780
Basin 79	7900	79000	790	790
Basin 80	8000	80000	800	800

Table 9: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 81	8100	81000	810	810
Basin 82	8200	82000	820	820
Basin 83	8300	83000	830	830
Basin 84	8400	84000	840	840
Basin 85	8500	85000	850	850
Basin 86	8600	86000	860	860
Basin 87	8700	87000	870	870
Basin 88	8800	88000	880	880
Basin 89	8900	89000	890	890
Basin 90	9000	90000	900	900

Table 10: Basin Data

Basin	Area (sq. ft.)	Volume (cu. ft.)	Flow (cfs)	Time (min)
Basin 91	9100	91000	910	910
Basin 92	9200	92000	920	920
Basin 93	9300	93000	930	930
Basin 94	9400	94000	940	940
Basin 95	9500	95000	950	950
Basin 96	9600	96000	960	960
Basin 97	9700	97000	970	970
Basin 98	9800	98000	980	980
Basin 99	9900	99000	990	990
Basin 100	10000	100000	1000	1000

PLATE 1

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
VOLCANO HEIGHTS
CONCEPTUAL DRAINAGE COMPACTION PLAN

(REV 12/2005)

EPC#1

CITY ADDRESS:

ADDRESS: 14900 Long Ave. N
CITY, STATE: Minneapolis, MN

OWNER:

CITY, STATE:

CITY, STATE:

CITY, STATE:

CITY, STATE: _____

TYPE OF SUBMITTAL:

CHECK TYPE OF APPROVAL SOUGHT

DRAINAGE PLAN 1st SUBMITTAL

CONCEPTUAL G & D PLAN

EROSION CONTROL PLAN

CLONMIR/LOMR

ENGINEER'S CERT (TCL)

OTHER (SPECIFY) _____

 OTHER (SPECIFY) _____

WAS A PRE-

COP

DATE SUBMITTED

required based on the following:

3. **Drainage Report:** Required for subdivision containing more than ten (10)

06126207

SECTION



4900 Lang Avenue NE
ALBUQUERQUE, NEW MEXICO 87109

(505) 348-4000
FAX (505) 348-4072

To: City of Albuquerque
600 2nd Street, NW
Albuquerque, NM 87102

Attn: Shahab Biazar, P.E.

TRANSMITTAL

Date: October, 2011
Job No.: X3-210-022
Volcano Heights Drainage Compilation Report

OCT 25 2011

RECEIVED

via Courier the following items:

- WE ARE SENDING YOU ☒ Attached ☐ Under Separate Cover
- ☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
- ☐ Copy of letter ☐ Change order ☒ Compilation Report

Copies	Date	Pages/Sheets	Description
1	Oct 2011	-	Volcano Heights Drainage Compilation Report
1	Oct 2011	2	Response to comments

THESE ARE TRANSMITTED AS CHECKED BELOW:

- ☐ For approval/signature ☐ Approved as submitted ☐ Resubmit _____ copies for approval
- ☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
- ☐ As requested ☐ Return _____ copies ☐ Return _____ corrected prints
- ☐ For review and comment ☐ _____
- ☐ FOR BIDS DUE _____, 20____ ☐ PRINTS ON LOAN - RETURN TO WCEA AFTER BID

Remarks: Attached is a copy of revised drainage report.

COPY TO: File: _____

SIGNED: _____
Donnie Duneman, PE

RECEIVED BY: _____
DATE: _____

(REV 12/2005)

ERQ#:

WORK ORDER#:

CITY ADDRESS: _____

ENGINEERING FIRM: Wilson & Company, Inc.

PHONE: 698-6021

ZIP CODE: 87109

ADDRESS: _____

PHONE: _____

ZIP CODE:

ARCHITECT: _____

CONTACT:

ZIP CODE:

SURVEYOR: _____

CONTACT:

ZIP CODE:

CONTRACTOR: _____

CONTACT:

ZIP CODE:

CHECK TYPE OF APPROVAL SOUGHT:

STAT/INANCIAL GUARANTEE RELEASE

PRELIMINARY PLAT APPROVAL

S. DEV. PLAN FOR SUB'D APPROVAL

S. DEV. FOR BLDG. PERMIT APPROVAL

SECTOR PLAN APPROVAL

FINAL PLAT APPROVAL

FOUNDATION PERMIT APPROVAL

BUILDING PERMIT APPROVAL.

CERTIFICATE OF OCCUPANCY (PERM),
CITY OF CHICAGO (CITY OF)

CERTIFICATE OF OCCUPANCY (IEMP)

GRADING PERMIT APPROVAL

HAVING PERMITS APPROXIMATELY

WORK ORDER APPROVAL

OTHER (SPECIFY):

YES ✓

NO

COPY PROVIDED

BY:

required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

*D₁₀/D₀₀₀ Boca Negra /
Mariposa Arroyo D_{MP}*

Another Future Condition adjustment to the Boca Negra watershed boundary is the 150-acre addition (Sub-basin 49, Figure 4) of the area south of Paseo del Norte between Universe and Unser. The northeast corner of The Trails Subdivision at Universe and Paseo del Norte adds another 90 acres to the Boca Negra watershed, and the northwest corner adds 160 acres. A 60-acre area was added to the northeast corner of Quail Ranch in Future Condition Sub-basin 19 (Figure 4). The 250-acre area south of Paseo del Norte between the North Geologic Window and Quail Ranch is a potential diversion to the watershed, however this area was not included in the Future Condition model.

3.3 Rainfall Data

This study investigates the impacts of the 10-year and 100-year frequency rainfall. The methods and procedures described in the City of Albuquerque Design Process Manual (DPM), 1997, were used to determine the rainfall distributions, land treatment values, time to peak, and other unit hydrograph parameters for each sub-basin. The design rainfalls in the DPM are based on the NOAA Atlas 2, Precipitation-Frequency Atlas of the Western United States, Vol. IV - New Mexico; and, in addition, they assume an Antecedent Moisture Condition (AMC) II for a normally dry watershed.

A depth-area reduction in rainfall was considered for this study. Upon inspection, and application of the NOAA Atlas 2 guidelines, the reduction was determined to be 12 percent for the one-hour, 5 percent for the 6-hour and 3 percent for the 24-hour storm in all sub-basins.

The following table lists the areally reduced rainfall depths for the 10-year and 100-year storms.

Duration (min)	10-year Depth (in)	100-year Depth (in)
60	0.95	1.64
360	1.34	2.11
1440	1.73	2.66

3.4 Routing

The Muskingum-Cunge Method of routing a hydrograph through a channel reach was used in the current model. Slopes, lengths and typical channel cross section profiles were determined from the 1999 digital mapping. Cross section locations were selected on orthophoto contour maps to represent average channel shapes through each routing segment. A Manning's n value of 0.035 was selected for the sparsely vegetated sandy soil channels. Flood plain slopes were assumed to be the same as channel slopes.

3.5 Sediment Yield and Flow Bulking

All Existing Condition flows in undeveloped areas were bulked by five percent above the escarpment, and nine percent below the escarpment, to account for sediment transport in the flow. Two percent bulking was applied to flows from developed areas. The five percent value has been used for other studies on the west mesa, eg. The Southwest Mesa watersheds. The nine percent value was used in studies of San Antonio Arroyo.

Annual sediment yield using the Flaxman Method was determined to be 0.132 ac-ft. /sq.mi. /yr. for the Boca Negra Arroyo and 0.171 ac-ft. /sq.mi. /yr. for the Mariposa in the Matotan Study.

According to the Design Analysis Report for the Mariposa Detention Basin Regional complex, by Easterling and Associates, June 1991, the Mariposa Basin/Dam "has received only approximately 1.1 acre feet of sediment since its construction in 1983 (0.011 acre-feet/square mile/year)."

During the present study, sediment sampling and equilibrium slope analysis was performed on the arroyo channel from the North Geologic Window to Boca Negra Pond. This is discussed in Section 6.5.



Arizona
California
Colorado
Kansas
Missouri
Nebraska
New Mexico
Oklahoma
Texas
Utah

Transmittal

Date: July 05, 11

To: Curtis Cherme

Plaza Del Sol

600 2nd Street NW

Albuquerque, NM 87102

924-3695

From: Maryam Ghihi, PE

2600 American Rd., SE Suite 100

Rio Rancho, NM 87124

File No:	08-400-104-00	
Phase:	02	Task: 8614
Dept:	8600	
Project:	SAD 228	
Telephone:		
Sent via: <input checked="" type="checkbox"/> Ground <input type="checkbox"/> 2 nd Day <input type="checkbox"/> Overnight <input type="checkbox"/> US Mail		

We Transmit:

- ☒ Attached
- ☐ Under separate cover via
- ☐ In accordance with your request

For Your:

- ☒ Approval
- ☒ Review and Comment
- ☐ Use
- ☐ Distribution to parties
- ☐ Record
- ☐ Information

The Following:

- ☐ Drawings
- ☐ Prints
- ☐ Specifications
- ☐ Change Order
- ☐ Shop Drawing Prints
- ☒ Other

Copies	Date	No.	Description
1	07-05-11	1	SAD 228, Drainage Report
1	07-05-11	1	Volcano Heights Conceptual Drainage Compilation Report

Comments:

Copies To: File

Signature

