HYDROLOGY SECTION
PLANNING DEPARTMENT
DEVELOPMENT & BUILDING SERVICES DIVISION
600 SECOND STREET NW SUITE 201
ALBUQUERQUE, NM 87102
505-924-3982

Records Withdrawal Form

Requested by: David C Rio Grande Engineering Phone No.: 321-9099
Name and Company

Hydrology File: Escavin - L09/D016

(a. File) b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

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a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Picked Up By:

Name: Mike Benoit Organization: Academy Reprographics
Print

Signed: _____ Date: 9/3/8

Office Use Only

Return Acknowledged:

Received by: S. Hardley Date: 09/04/08

Planning Department
Richard Dineen, Director

Draft for Brad

November 7, 2007

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
4416 Anaheim Ave., NE
Albuquerque, NM 87113

RE: Esencia Subdivision L8/D016, Conceptual Grading Plan Approval

Dear Shahab Biazar, P.E.:

The conceptual grading plan for Subdivision L8/D016 project does not provide the necessary information to determine the impacts to the City of Albuquerque. There are some concerns with the proposed plan that should be addressed in the drainage report for the project.

City of Albuquerque Required Items:

- Please include all relevant hydrologic and hydraulic calculations and parameters used in the design of the drainage system. This includes all hydraulic calculations of the pond and other drainage areas entering the City of Albuquerque storm drain system. In particular, please show calculations for the detention pond, areas not detained and how downstream conditions affect flow. There does not appear to be any calculations for flow that does not appear to be captured by the detention basin. In addition, the included topographic maps appear to show offsite drainage that is directed to the site and must be considered.
- It should be noted that the proposed detention basin appears to require greater storage than represented in the drawings and AHYMO input files. The current proposal assumes full orifice flow with no downstream constrictions and allows for the flooding of an entrance to the subdivision.
- It appears that the basin was sized only using a six-hour storm. Incorporating a larger storm for detention basin sizing may require increased storage.
- The northern lots appear to drain to the back of the lot rather than to the street at the front. It is not apparent how this drainage area will enter the City of Albuquerque storm drainage system.
- Why is drainage for 118th Street not to be contained within the proposed retention basins? How will this drainage affect the City of Albuquerque storm drainage system.
- AMAFCA must approve the conceptual plan.
- A maintenance agreement must be in place with the plan clearly defining responsibilities of the drainage system between home-owners, Bernalillo County, and City of Albuquerque.
- Does Bernalillo County accept creating permanent retention basins within the 118th Street right of way? This may impose restrictions on future street

widening projects. In addition, do these retention areas require infiltration into the road base?

Other Items that May Require County Review

- There are streets with slopes in excess of 4%. Please note that momentum components of flow must be analyzed to determine if the flow will remain within the street and not exit through curb cuts.
- Show a cross section through the proposed 32' high retaining wall.
- Lot elevations at all corners should be shown with drainage direction shown.

The drainage master plan appears to be correctly interpreted in the conceptual plan. However, further detail is required prior to acceptance by the City of Albuquerque.

If you have any questions please contact me.

Paul Olson
Construction Engineer
505-924-3421

Cc: Brad Bingham, COA Planning Dept., Principal Engineer Hydrology and Hydraulics

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

New Mexico 35.033 N 106.791 W 5593 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Thu Nov 1 2007

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Help | D

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.18	0.27	0.34	0.45	0.56	0.65	0.70	0.80	0.89	1.01	1.08	1.32	1.52	1.69	2.15	2.58	3.15	3.63
2	0.23	0.35	0.44	0.59	0.73	0.83	0.89	1.01	1.13	1.27	1.35	1.64	1.89	2.10	2.67	3.21	3.90	4.50
5	0.31	0.47	0.59	0.79	0.98	1.10	1.16	1.30	1.43	1.59	1.69	2.02	2.31	2.58	3.25	3.87	4.66	5.39
10	0.37	0.56	0.70	0.94	1.17	1.32	1.38	1.53	1.66	1.85	1.96	2.32	2.64	2.95	3.69	4.37	5.20	6.02
25	0.45	0.69	0.86	1.16	1.43	1.62	1.68	1.85	1.98	2.19	2.32	2.73	3.07	3.45	4.25	4.99	5.87	6.79
50	0.52	0.79	0.98	1.32	1.63	1.86	1.92	2.09	2.23	2.46	2.60	3.04	3.40	3.83	4.66	5.44	6.34	7.32
100	0.59	0.89	1.11	1.49	1.84	2.11	2.18	2.35	2.49	2.73	2.89	3.35	3.73	4.21	5.06	5.87	6.77	7.81
200	0.66	1.00	1.24	1.67	2.07	2.37	2.45	2.61	2.75	3.02	3.19	3.66	4.05	4.59	5.44	6.27	7.16	8.26
500	0.75	1.15	1.42	1.91	2.37	2.74	2.83	2.98	3.11	3.40	3.59	4.08	4.47	5.09	5.92	6.77	7.62	8.79
1000	0.83	1.26	1.57	2.11	2.61	3.04	3.14	3.28	3.40	3.69	3.90	4.39	4.78	5.46	6.27	7.12	7.92	9.14

Text version of table

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

Paul Olson 11/1/07

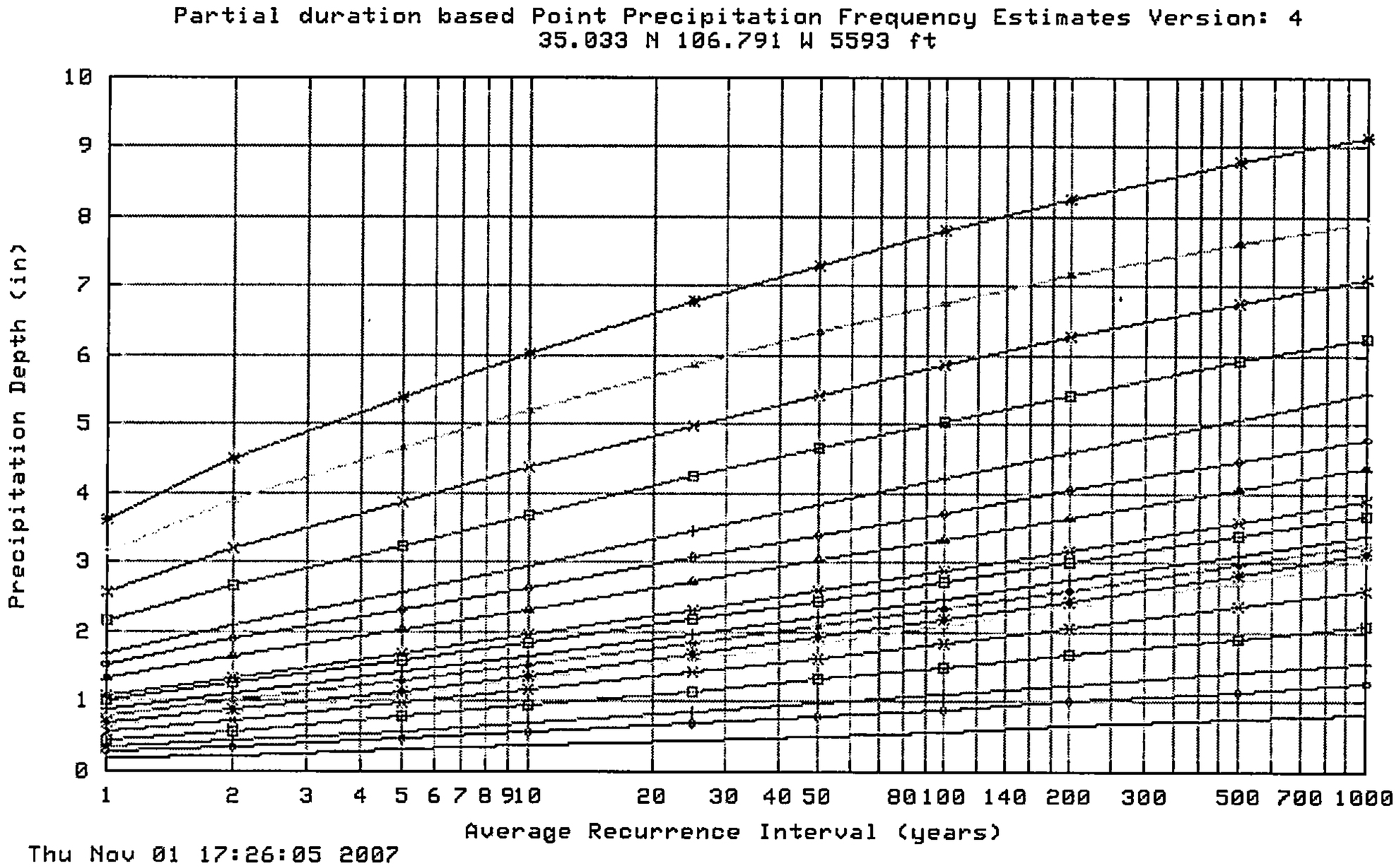
Maintenance Agreement in Place

Check downstream

AMAFCA approval

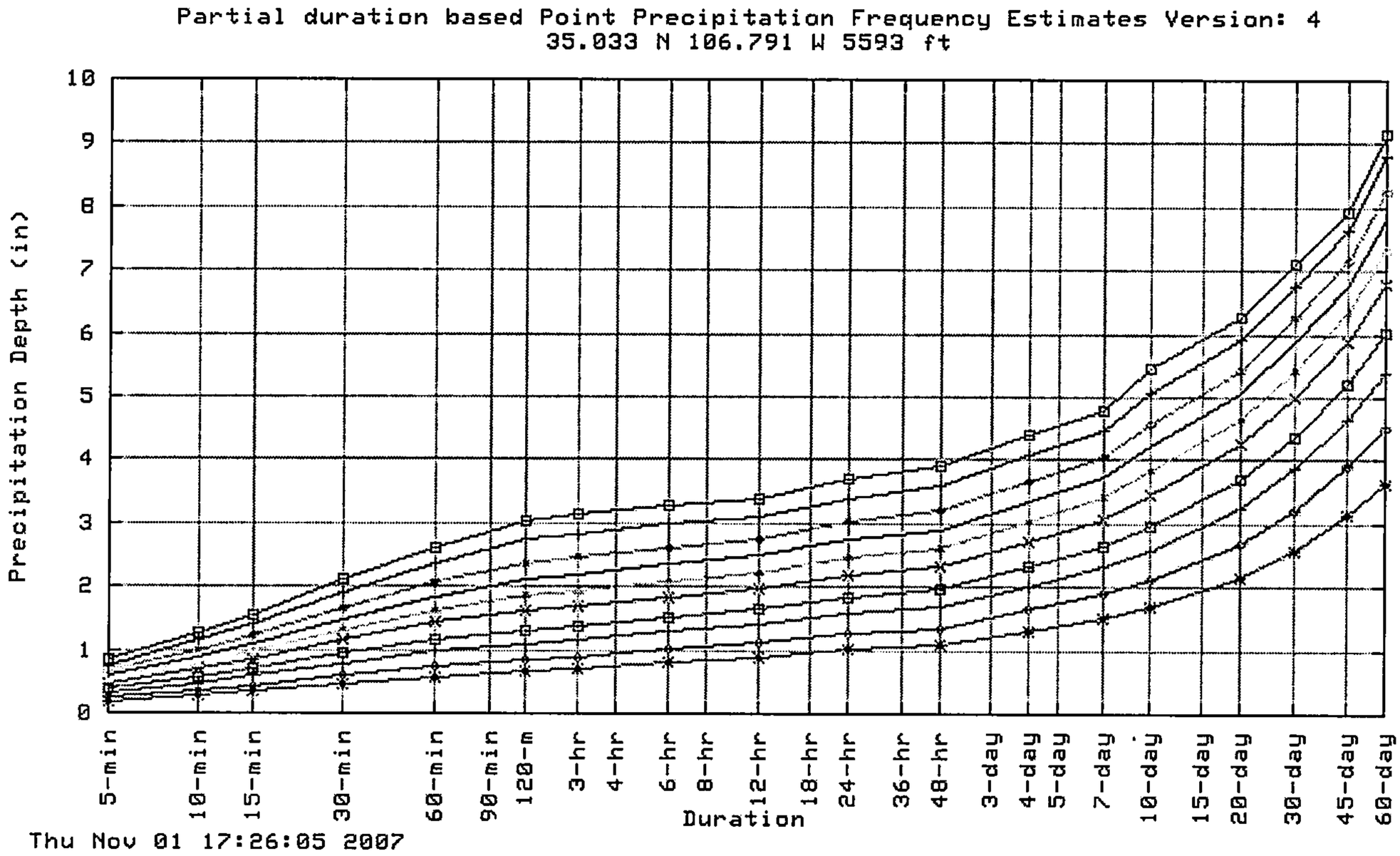
Show 32' wall

Recommend Corner points for lots



Thu Nov 01 17:26:05 2007

Duration			
5-min	[illegible]	48-hr	30-day
10-min	3-hr	4-day	45-day
15-min	6-hr	7-day	60-day
30-min	12-hr	10-day	
60-min	24-hr	20-day	



Confidence Limits -

*** Upper bound of the 90% confidence interval**
Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.21	0.32	0.39	0.53	0.65	0.77	0.82	0.93	1.02	1.15	1.21	1.45	1.66	1.84	2.34	2.80	3.41	3.94
2	0.27	0.41	0.51	0.68	0.84	0.99	1.04	1.18	1.28	1.45	1.52	1.80	2.07	2.29	2.91	3.48	4.22	4.88
5	0.36	0.55	0.68	0.92	1.13	1.30	1.36	1.51	1.62	1.81	1.90	2.21	2.53	2.81	3.54	4.20	5.04	5.84
10	0.43	0.65	0.81	1.09	1.35	1.55	1.61	1.78	1.89	2.10	2.20	2.54	2.88	3.21	4.01	4.74	5.63	6.52
25	0.53	0.80	0.99	1.33	1.65	1.90	1.96	2.14	2.25	2.49	2.60	2.98	3.35	3.75	4.62	5.40	6.36	7.35
50	0.60	0.91	1.13	1.52	1.88	2.17	2.24	2.42	2.53	2.78	2.91	3.31	3.71	4.16	5.07	5.88	6.87	7.92
100	0.68	1.03	1.28	1.72	2.13	2.46	2.54	2.71	2.82	3.09	3.23	3.65	4.07	4.58	5.50	6.35	7.33	8.46
200	0.76	1.15	1.43	1.93	2.38	2.77	2.85	3.02	3.12	3.41	3.57	4.00	4.42	4.99	5.91	6.79	7.76	8.96
500	0.87	1.32	1.64	2.21	2.73	3.20	3.29	3.44	3.54	3.84	4.02	4.46	4.88	5.53	6.44	7.33	8.27	9.54
1000	0.96	1.46	1.81	2.44	3.02	3.56	3.65	3.80	3.87	4.17	4.37	4.81	5.23	5.94	6.83	7.72	8.60	9.93

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

*** Lower bound of the 90% confidence interval**

Precipitation Frequency Estimates (inches)

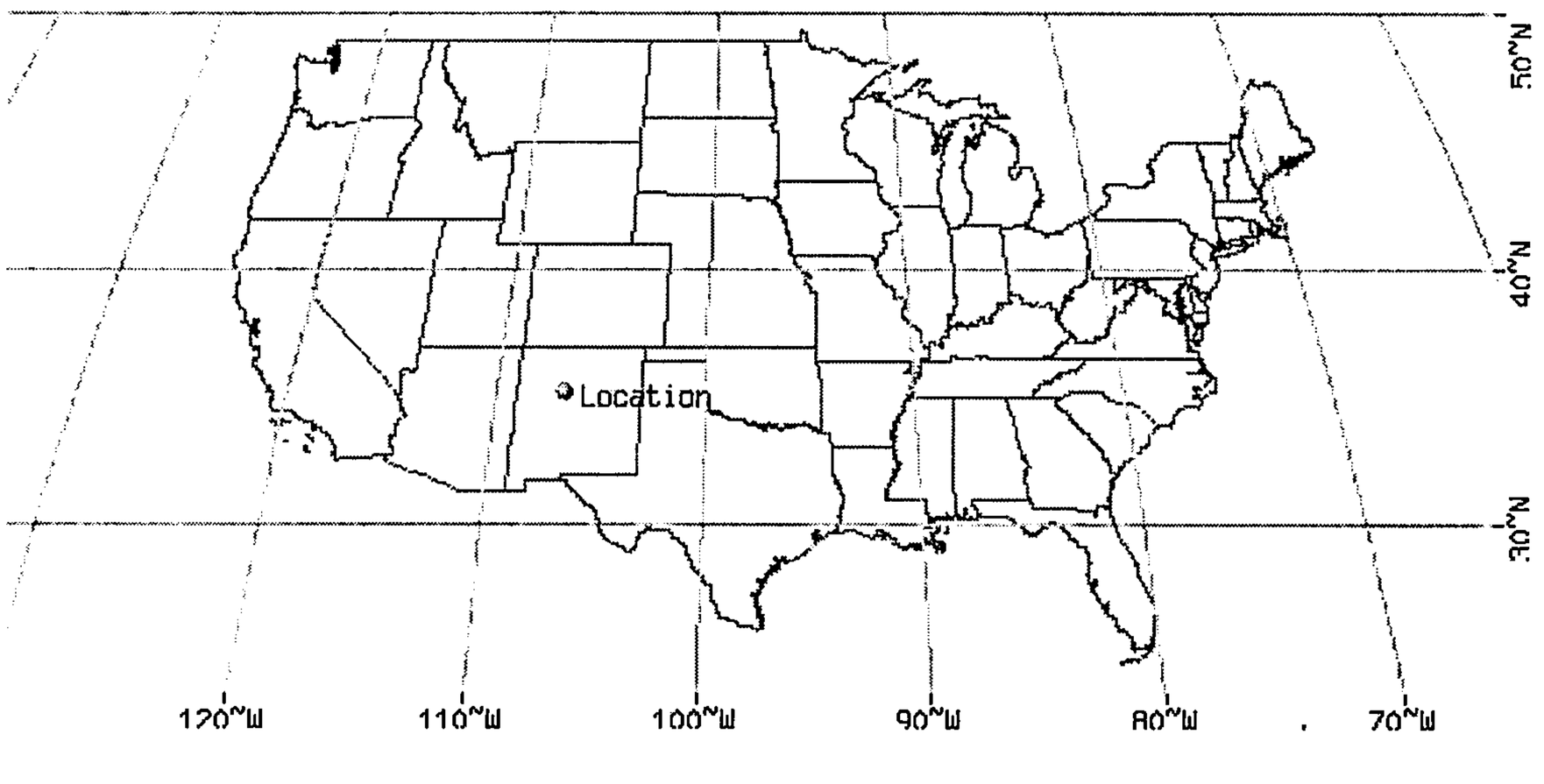
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.15	0.23	0.29	0.39	0.48	0.56	0.60	0.70	0.78	0.90	0.96	1.20	1.39	1.55	1.96	2.37	2.89	3.34
2	0.20	0.30	0.37	0.50	0.62	0.71	0.76	0.88	0.99	1.12	1.20	1.50	1.73	1.92	2.44	2.94	3.59	4.14
5	0.27	0.40	0.50	0.67	0.83	0.94	1.00	1.14	1.25	1.41	1.50	1.84	2.11	2.36	2.97	3.55	4.29	4.96
10	0.32	0.48	0.60	0.80	0.99	1.12	1.18	1.33	1.45	1.63	1.74	2.11	2.41	2.70	3.37	4.00	4.79	5.54
25	0.39	0.59	0.73	0.98	1.21	1.37	1.43	1.59	1.72	1.93	2.05	2.47	2.80	3.15	3.88	4.56	5.40	6.24
50	0.44	0.67	0.83	1.11	1.38	1.56	1.63	1.80	1.93	2.15	2.29	2.75	3.09	3.49	4.24	4.96	5.82	6.72
100	0.49	0.75	0.93	1.25	1.55	1.76	1.84	2.01	2.14	2.39	2.54	3.02	3.38	3.82	4.60	5.35	6.21	7.17
200	0.55	0.83	1.03	1.39	1.72	1.97	2.05	2.22	2.35	2.62	2.78	3.29	3.67	4.16	4.93	5.71	6.56	7.58
500	0.62	0.95	1.17	1.58	1.96	2.25	2.34	2.51	2.63	2.93	3.11	3.65	4.03	4.58	5.36	6.14	6.98	8.05
1000	0.68	1.04	1.28	1.73	2.14	2.47	2.57	2.74	2.85	3.17	3.36	3.92	4.29	4.89	5.66	6.45	7.25	8.38

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.

** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

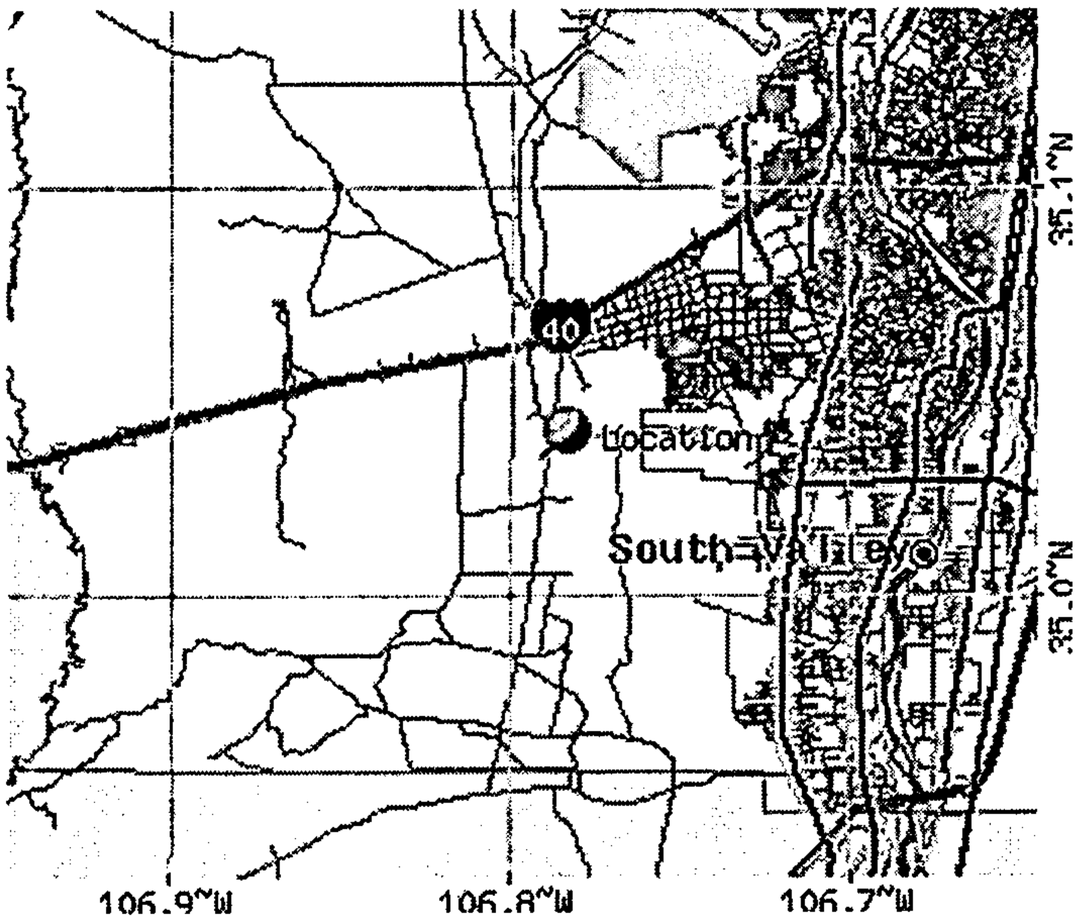
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

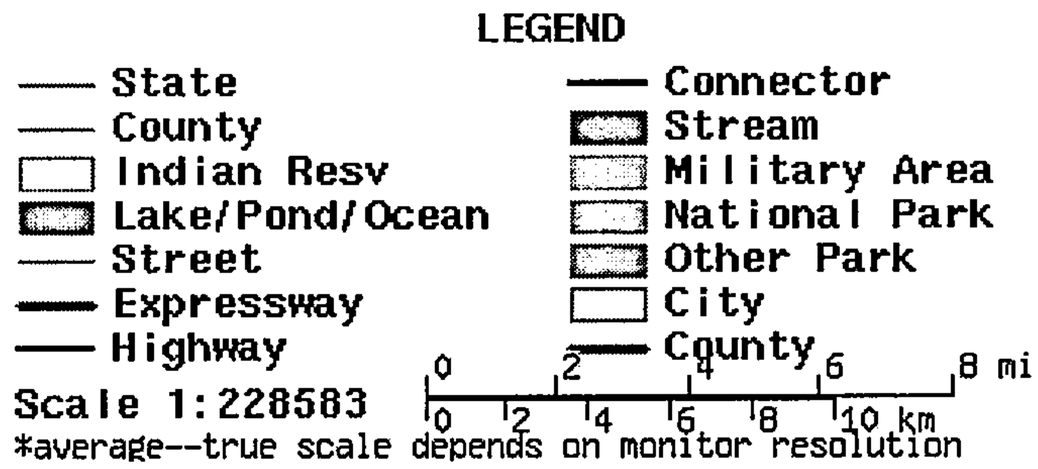
Maps -



These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

Please read disclaimer for more information.





Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

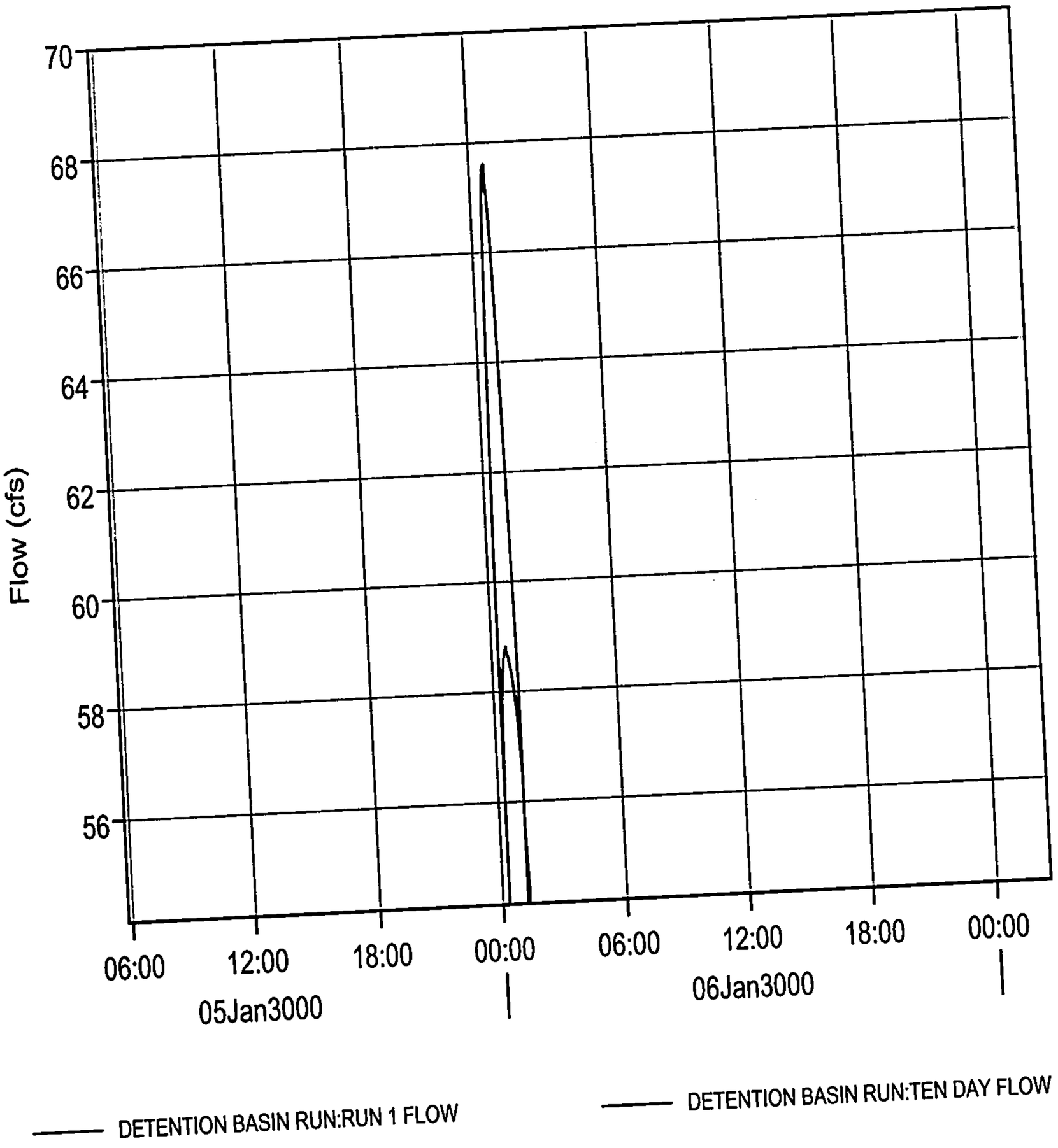
+/-30 minutes ...OR... +/-1 degree of this location (35.033/-106.791). Digital ASCII data can be obtained directly from **NCDC**.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer


70
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56
Flow (cfs)
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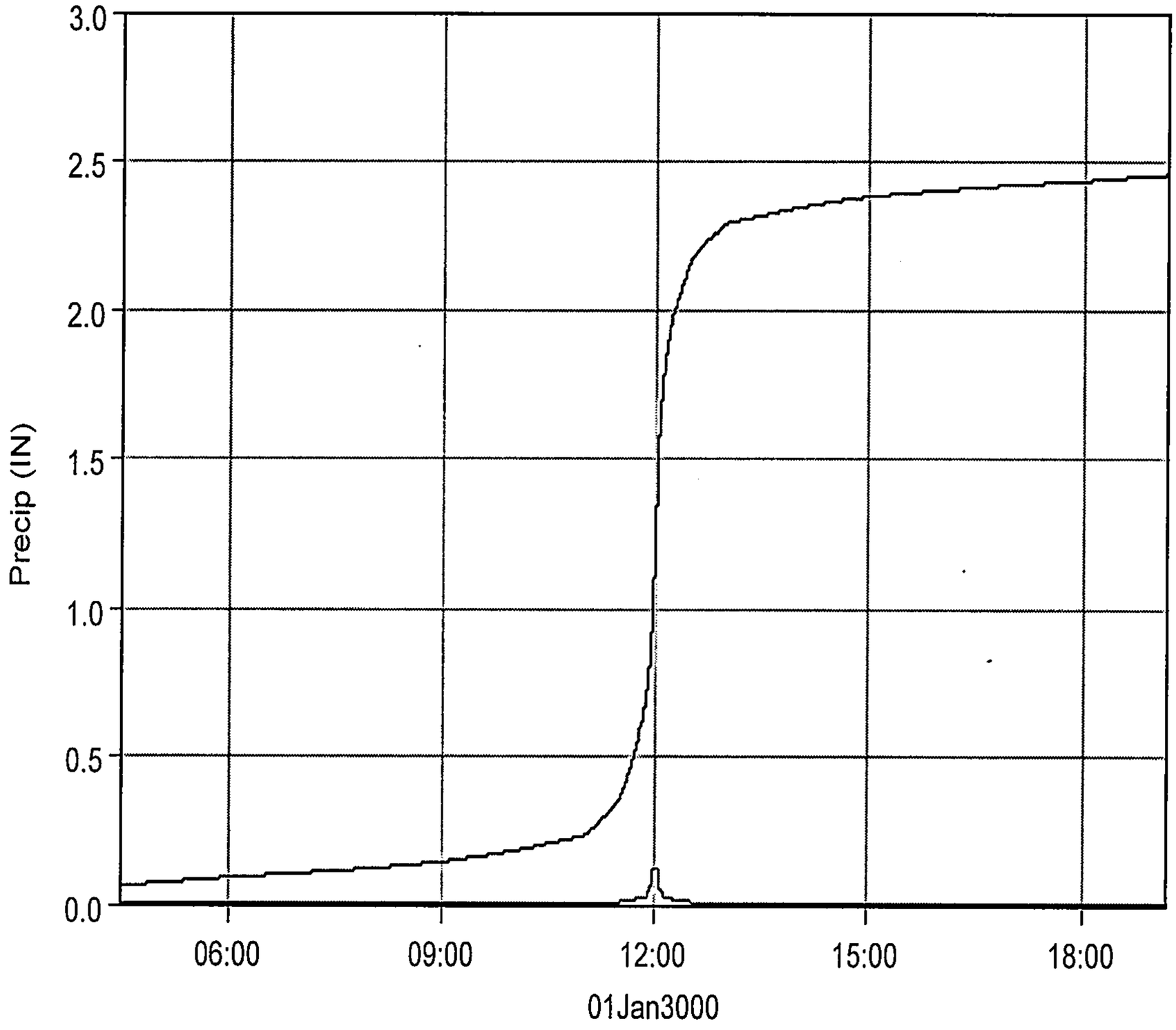
DETENTION BASIN RUN:RUN 1 FLOW
DETENTION BASIN RUN:TEN DAY FLOW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SUBDIVISION MODIFIED-RUN:TEN DAY PRECIP-EXCESS
SUBDIVISION RUN:TEN DAY PRECIP-EXCESS

200726-DRN

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(Rev. 12/05)

PROJECT TITLE: ESENCIA SUBDIVISION **ZONE ATLAS/DRG. FILE #:** L8 D014

DRB #: _____ **EPC #:** _____ **WORK ORDER #:** _____

LEGAL DESCRIPTION: TRACTS 21-25, ROW 3, UNIT B WEST OF WESTLAND (UNRECORDED SUBDIVISION) AND UNPLATED TRACT OF THE ATRISCO GRAN

CITY ADDRESS: _____

ENGINEERING FIRM: Advanced Engineering and Consulting, LLC **CONTACT:** Shahab Biazar
ADDRESS: 4416 Anaheim Ave., NE **PHONE:** (505) 899-5570
CITY, STATE: Albuquerque, New Mexico **ZIP CODE:** 87113

OWNER: _____ **CONTACT:** _____
ADDRESS: _____ **PHONE:** _____
CITY, STATE: _____ **ZIP CODE:** _____

ARCHITECT: _____ **CONTACT:** _____
ADDRESS: _____ **PHONE:** _____
CITY, STATE: _____ **ZIP CODE:** _____

SURVEYOR: _____ **CONTACT:** _____
ADDRESS: _____ **PHONE:** _____
CITY, STATE: _____ **ZIP CODE:** _____

CONTRACTOR: _____ **CONTACT:** _____
ADDRESS: _____ **PHONE:** _____
CITY, STATE: _____ **ZIP CODE:** _____

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1ST SUBMITTAL
- ____ DRAINAGE PLAN RESUBMITTAL
- X CONCEPTUAL GRADING & DRAINAGE PLAN
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- ____ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR / LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER/ARCHITECT CERT (TCL)
- ____ ENGINEER/ARCHITECT CERT (DRB S.P.)
- ____ ENGINEER/ARCHITECT CERT (AA)
- ____ OTHER (SPECITY)

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SIA / FINANCIAL GUARANTEE RELEASE
- ____ PRELIMINARY PLAT APPROVAL
- ____ 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 (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- X CONCEPTUAL GRADING PLAN APPROVAL

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
OCT 22 2007
HYDROLOGY SECTION

DATE SUBMITTED: 10 / 19 / 2007 **BY:** Shahab Biazar, P.E.

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittals may be required based on the following:

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

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

October 19, 2007

Mr. Jame J. Eisenberg, P.E
Bernalillo County Public Works Department
2400 Broadway SE
Albuquerque, New Mexico 87102

RE: ESENCIA SUBDIVISION CONCEPTUAL GRADING AND DRAINAGE PLAN, TRACTS 21-25, ROW 3, UNIT B WEST OF WESTLAND (UNRECORDED SUBDIVISION) AND UNPLATED TRACT OF THE ATRISCO GRANT , ZAP L-8

Dear Mr. Eisenberg:

Enclosed please find the Conceptual Grading Plan for Esencia Subdivision. This plan is very conceptual since the site layout may change. The site falls within the Snow Vista Development Constraints with allowable discharge rate of 1.29 cfs per acre. See attached Proposed DMP Facility Map for the location of the site (hatched area in red is the Snow Vista Basin) in relation to the Snow Vista Drainage Basin. Therefore, the drainage for this subdivision will be designed to drain per the master plan. The site is 51.41 acres, and the total allowable discharge would be (51.41x1.29) 66.32 cfs. This project will drain to a proposed detention pond and will discharge the runoff at a confined rate. We have preformed the AHYMO routing (assuming that all the runoff from the project will drain to the pond), and the maximum runoff discharge is at 64.12 cfs. Inlets will be added on 114th Street to intercept the runoff within the street. All the runoff will drain to a Manhole located at the intersection of 114th Street and Connemara Ave., SW. From there the runoff drains east via 42" storm drain pipe. The Pipe is designed for a 130 cfs flow rate (which is based on the 1.29 cfs/acres according to the Sunrise Terrace West Drainage Plan). See attached copy of sheet 3 of the report for Sunrise Terrace West. As indicated on the report the runoff from the City Westside Satellite Center and the runoff from Basin 310 (where our project is located at) will drain to the 42" pipe at total allowable discharge of 1.29 cfs/acre.

Additional inlets will be placed within 114th Street to intercept the runoff within the street. A full analysis of required inlets will be shown on the final grading and drainage plan. The runoff within 118th Street will drain to the median and will be retained within that area. Some retention ponds are also proposed on the west of 118th Street as well. Full analysis of all the ponds will be submitted with final grading and drainage plan. The offsite basin to the west of our project is part of the Powerline Basin. Based on the Powerline Basin the runoff is intercepted by an earthen channel. From there the runoff drains south. The runoff to the north and to the south of the project drains east. No offsite enter the site.

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

Onsite runoff will drain to the proposed detention pond on site. Full analysis of the street flow analysis and on-site sub-basin analysis will be preformed to establish the extend of required storm drain pipes and inlets to not exceed the street flow capacity. The required mountable curb and gutter as well as standard curb gutter will be analyzed as part of the final grading and drainage plan as well. Attached please find copies of the as-built for the existing storm drain pipes and their proposed flows. Attached also find the preliminary AHYMO calculations for ponding conditions.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

CC: Brad Bingham, City of Albuquerque

The storm drain also drains a portion of local flow from Sunrise Terrace West. Flow will drain to Connemara overland via streets. Inlets will be provided in Connemara to collect flow as shown in Plate 2.

Runoff generated from Roan and Suffolk Avenues will drain into 110th Street in Unit 7. A 30-inch storm drain in 110th Street, built with Unit 7, carries runoff to the intersection of Connemara and 110th Street. The 110th Street and Connemara storm drains combine here and the pipe is up sized to a 54-inches. It runs parallel to the pond to two surge structures. Flow either continues to drain through the pipe or surges out of the structures into the central pond as described in detail in the Unit 7 Drainage Report.

The existing standpipe in the central pond will remain and function as the pond outlet as described above for existing conditions. Maximum outflow from the standpipe is 10cfs as designed and built in conjunction with Sunrise Terrace Unit 6.

Runoff from the south side of the subdivision flows overland via streets to inlets and storm drain in Andalusian near the intersection of 110th Street or the storm drain in 110th Street. Runoff is carried east out of the project, in Andalusian by way of the existing 48 inch pipe as planned in the Master Drainage Plan. Grades on 110th Street will drain north to the pond so any runoff not collected in the storm drain will drain overland in the street to the pond.

Also as part of this project, one half of Eucariz Avenue will be extended west to 114th Street from the City Limit. A 36-inch storm drain and inlet, constructed in conjunction with Unit 7, extends approximately 100 feet in Eucariz beyond 106th Street. A ditch will be constructed parallel to Eucariz Avenue to direct flow into the inlet. The ditch has adequate capacity for the offsite flows from the north.

ULTIMATE

The ultimate development condition is defined as complete development of the site as well as all surrounding areas. Ultimate condition off-site drainage basins can be seen in Figure 4.

As called for in the Master Drainage Plan, flow from the City Westside Satellite Center will drain at a maximum controlled discharge rate of 1.29 cfs per acre to a proposed storm drain. As shown in Figure 4, the storm drain will run along future 114th Street to intercept flow from Basin 310. Again a controlled discharge of 1.29 cfs/acre will limit the flow from Basin 310. The planned 42-inch storm drain then runs through Basin 331 in Connemara Avenue to the pond in Unit 7. The pipe will carry the 130cfs from off site and developed flow from Sunrise Terrace West.

Is a Storm drain required in 114th. in the ultimate condition?

```
**********************************************************************
*                      PONDING CONDITION                             *
**********************************************************************
ROUTE RESERVOIR     ID=30 HYD NO=501.1 INFLOW ID=10 CODE=24
                    OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                        0.00              0.0000        5296.50
                       11.86              0.1677        5298.00
                       18.58              0.2281        5298.50
                       27.46              0.3754        5099.50
                       34.10              0.5582        5300.50
                       39.65              0.7765        5301.50
                       44.51              1.0303        5302.50
                       48.89              1.3197        5303.50
                       52.90              1.6445        5304.50
                       56.64              2.0048        5305.50
                       60.14              2.4006        5306.50
                       63.45              2.8320        5307.50
                       66.59              3.2988        5308.50

  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *

    TIME       INFLOW     ELEV       VOLUME     OUTFLOW
    (HRS)      (CFS)      (FEET)     (AC-FT)    (CFS)

     .00         .00    5296.50        .000        .00
     .80         .00    5296.50        .000        .00
    1.60      137.52    5306.56       2.426      60.33
    2.40        8.04    5304.21       1.552      51.75
    3.20        1.62    5297.02        .058       4.09
    4.00        1.00    5296.64        .015       1.09
    4.80         .98    5296.62        .014        .97
    5.60        1.12    5296.64        .015       1.08
    6.40         .10    5296.55        .006        .39
    7.20         .00    5296.50        .000        .01
 PEAK DISCHARGE =        64.122 CFS - PEAK OCCURS AT HOUR    1.83
 MAXIMUM WATER SURFACE ELEVATION =     5307.714
 MAXIMUM STORAGE =         2.9319 AC-FT      INCREMENTAL TIME=     .033330HRS

**********************************************************************
*
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 11:26:22
```

VOLUME CALCULATIONS

DETENTION POND

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2

C = (At - Ab) / Dt

Ab =	4,870.48
At =	23,428.38
Dt =	12.00
C =	1546.49

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
5296.50	0.00	0.0000	0.00
5298.00	1.50	0.1677	11.86
5298.50	2.00	0.2281	18.58
5299.50	3.00	0.3754	27.46
5300.50	4.00	0.5582	34.10
5301.50	5.00	0.7765	39.65
5302.50	6.00	1.0303	44.51
5303.50	7.00	1.3197	48.89
5304.50	8.00	1.6445	52.90
5305.50	9.00	2.0048	56.64
5306.50	10.00	2.4006	60.14
5307.50	11.00	2.8320	63.45
5308.50	12.00	3.2988	66.59

5297.65 center orifice

Pipe flow will control

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)=	27.75
Area (ft^2)=	4.2000
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =10/19/2007
INPUT FILE = 618a USER NO.= AHYMO-I-9702c01000R31-AH

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										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.200
COMPUTE NM HYD	101.00	-	1	.08033	67.30	1.882	.43925	1.533	1.309	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.470
COMPUTE NM HYD	111.00	-	1	.08034	12.71	.354	.08264	1.533	.247	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.200
COMPUTE NM HYD	101.10	-	10	.08034	196.43	7.092	1.65498	1.500	3.820	PER IMP=	75.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.470
COMPUTE NM HYD	111.10	-	1	.08034	122.06	4.255	.99309	1.500	2.374	PER IMP=	75.00
FINISH											

NOTES:

1. SEE SHEET 2 FOR PROJECT IDENTIFICATION LISTING
2. SEE LARGER SCALE BASIN MAPS IN SECTION III OF VOLUME I FOR DETAILS.
3. SEE AERIAL AND CONTOUR MAPS IN VOLUME II FOR DETAILS

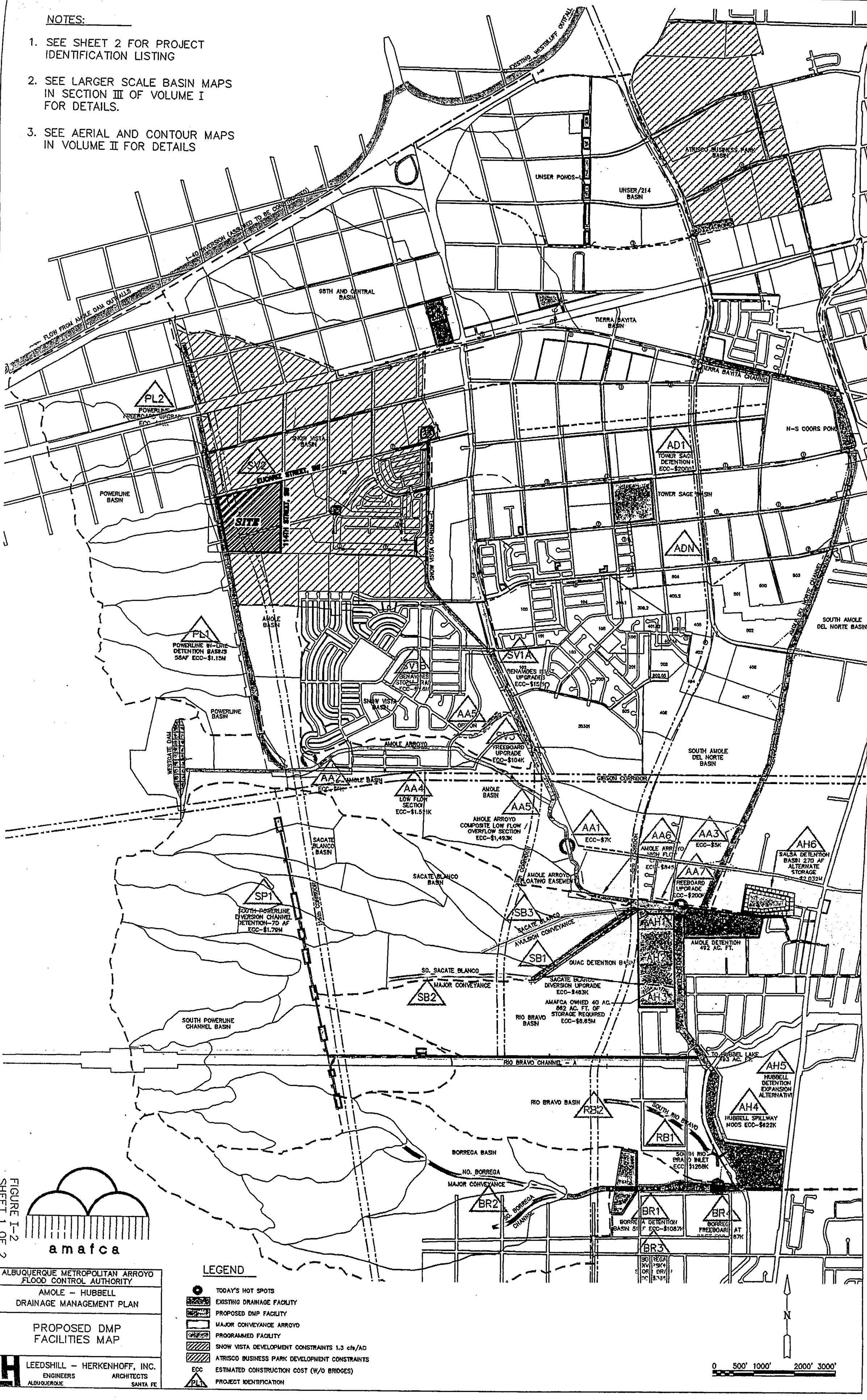


FIGURE I-2
SHEET 1 OF 2

amafca

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

AMOLE – HUBBELL DRAINAGE MANAGEMENT PLAN

PROPOSED DMP FACILITIES MAP

LEEDSHILL – HERKENHOFF, INC.
ENGINEERS ARCHITECTS
ALBUQUERQUE SANTA FE

LEGEND

- TODAY'S HOT SPOTS
- EXISTING DRAINAGE FACILITY
- PROPOSED DMP FACILITY
- MAJOR CONVEYANCE ARROYO
- PROGRAMMED FACILITY
- SNOW VISTA DEVELOPMENT CONSTRAINTS 1.3 cfs/AC
- ATRISCO BUSINESS PARK DEVELOPMENT CONSTRAINTS
- ECC ESTIMATED CONSTRUCTION COST (W/O BRIDGES)
- PL1 PROJECT IDENTIFICATION

AHYMO INPUT FILE
(PONDING CONDITIONS)

```
*
* ZONE 1
*
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
*
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN DT=0.03333 HR
* ON-SITE
COMPUTE NM HYD          ID=10 HYD NO=101.1 AREA=0.080344 SQ MI
                        PER A=0.00 PER B=20.00 PER C=5.00 PER D=75.00
                        TP=0.1333 HR MASS RAINFALL=-1
                        TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*                       PONDING CONDITION                            *
**********************************************************************
ROUTE RESERVOIR         ID=30 HYD NO=501.1 INFLOW ID=10 CODE=24
                        OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                             0.00              0.0000        5296.50
                            11.86              0.1677        5298.00
                            18.58              0.2281        5298.50
                            27.46              0.3754        5099.50
                            34.10              0.5582        5300.50
                            39.65              0.7765        5301.50
                            44.51              1.0303        5302.50
                            48.89              1.3197        5303.50
                            52.90              1.6445        5304.50
                            56.64              2.0048        5305.50
                            60.14              2.4006        5306.50
                            63.45              2.8320        5307.50
                            66.59              3.2988        5308.50
**********************************************************************
*
FINISH
```

SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =10/19/2007
INPUT FILE = 618PD USER NO.= AHYMO-I-9702c01000R31-AH

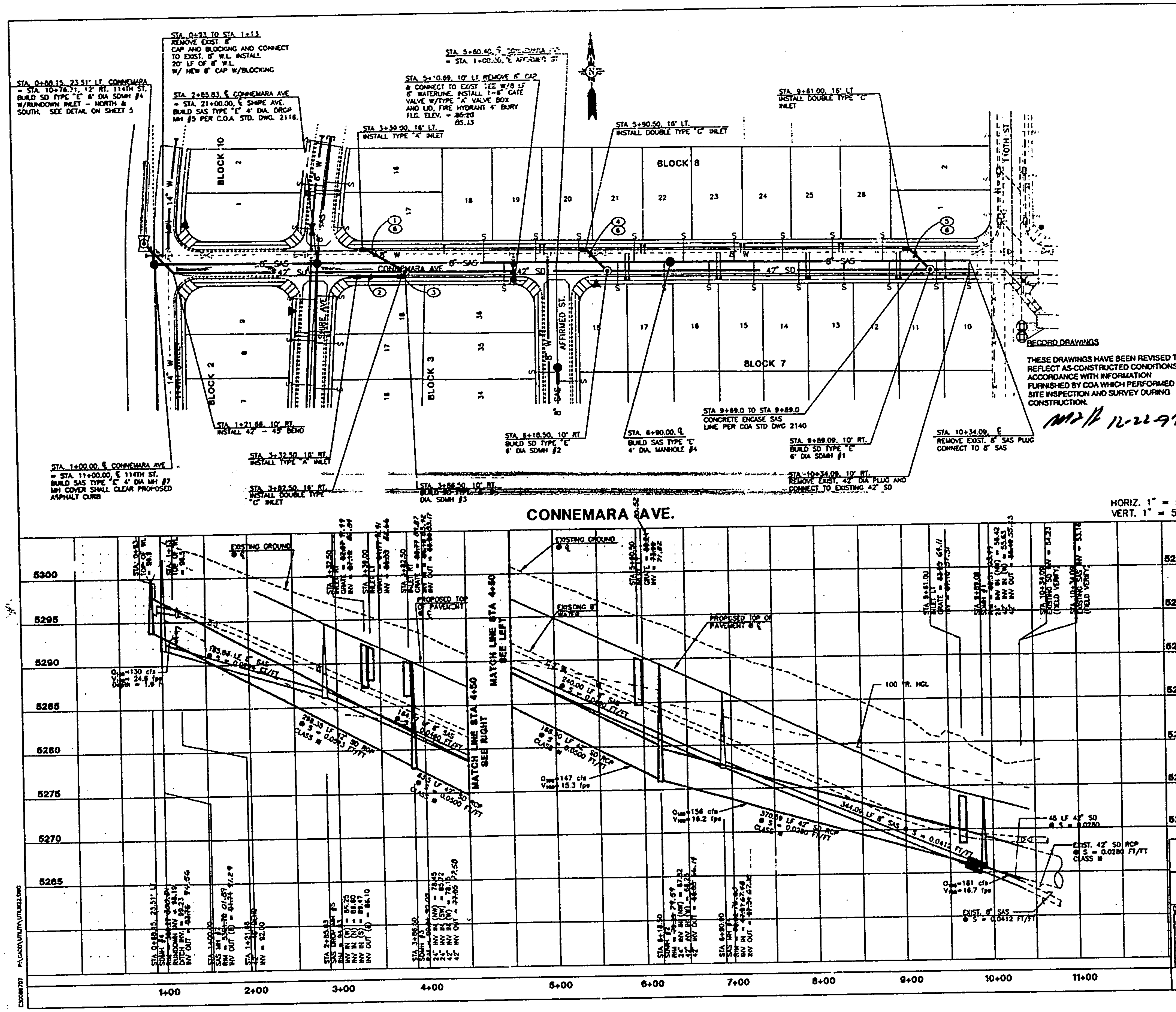
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.200
COMPUTE NM HYD	101.10	-	10	.08034	196.43	7.092	1.65498	1.500	3.820	PER IMP=	75.00
ROUTE RESERVOIR	501.10	10	30	.08034	64.12	7.092	1.65498	1.833	1.247	AC-FT=	2.932
FINISH											

AHYMO INPUT FILE

```
* ZONE 1
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)          *
**********************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN DT=0.03333 HR
* ON-SITE
COMPUTE NM HYD          ID=1 HYD NO=101.0 AREA=0.080334 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*          10-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)          *
**********************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.25 IN RAIN SIX=1.47 IN
                        RAIN DAY=1.77 IN DT=0.03333 HR
* ON-SITE
COMPUTE NM HYD          ID=1 HYD NO=111.0 AREA=0.080344 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN DT=0.03333 HR
* ON-SITE
COMPUTE NM HYD          ID=10 HYD NO=101.1 AREA=0.080344 SQ MI
                        PER A=0.00 PER B=20.00 PER C=5.00 PER D=75.00
                        TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*          10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.25 IN RAIN SIX=1.47 IN
                        RAIN DAY=1.77 IN DT=0.03333 HR
* ON-STIE
COMPUTE NM HYD          ID=1 HYD NO=111.1 AREA=0.080344 SQ MI
                        PER A=0.00 PER B=20.00 PER C=5.00 PER D=75.00
                        TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
FINISH
```

AHYMO OUTPUT FILE
(PONDING CONDITIONS)

```
    AHYMO PROGRAM (AHYMO_97) -                          - Version:  1997.02d
         RUN DATE (MON/DAY/YR) = 10/19/2007
         START TIME (HR:MIN:SEC) = 11:26:22     USER NO.= AHYMO-I-9702c01000R31-AH
         INPUT FILE = 618PD

*
* ZONE 1
*
*****************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)      *
*****************************************************************
*
START                TIME=0.0
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                     RAIN DAY=2.66 IN DT=0.03333 HR

                  COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                  DT =     .033330 HOURS       END TIME =     5.999400 HOURS
                     .0000   .0016   .0033   .0050   .0067   .0085   .0103
                     .0122   .0141   .0160   .0180   .0201   .0222   .0243
                     .0266   .0289   .0312   .0337   .0362   .0388   .0415
                     .0443   .0472   .0502   .0534   .0567   .0601   .0637
                     .0675   .0715   .0758   .0809   .0865   .0924   .1050
                     .1334   .1771   .2398   .3254   .4379   .5814   .7600
                     .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
                    1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
                    1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
                    1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
                    1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
                    2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                    2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
                    2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
                    2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
                    2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                    2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
                    2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                    2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                    2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
                    2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                    2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
                    2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                    2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
                    2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
                    2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

* ON-SITE
COMPUTE NM HYD       ID=10 HYD NO=101.1 AREA=0.080344 SQ MI
                     PER A=0.00 PER B=20.00 PER C=5.00 PER D=75.00
                     TP=0.1333 HR MASS RAINFALL=-1
                     TP=0.1333 HR MASS RAINFALL=-1

     K =   .072951HR    TP =   .133300HR    K/TP RATIO =   .547271     SHAPE CONSTANT, N =  7.068678
     UNIT PEAK =   237.10    CFS   UNIT VOLUME =    .9993       B =   524.50      P60 = 1.8700
     AREA =      .060258 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .125269HR    TP =   .133300HR    K/TP RATIO =   .939750     SHAPE CONSTANT, N =  3.762760
     UNIT PEAK =   51.086    CFS   UNIT VOLUME =    1.000       B =   339.03      P60 = 1.8700
     AREA =      .020086 SQ MI    IA =    .47000 INCHES    INF =   1.16600 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```



GENERAL NOTES

1. ALL STATIONING REFERS TO STREET CENTERLINE.
2. ALL FITTINGS AND VALVES ON WATERLINES SHALL HAVE RESTRAINED JOINTS PER THE SCHEDULE ON DETAIL SHEET 6.
3. CONCRETE BLOCKING PER C.O.A. STANDARD DRAWING 2320 SHALL BE PLACED AT ALL WATERLINE CAPS IN LIEU OF RESTRAINED JOINTS.
4. CONSTRUCT FIRE HYDRANTS PER C.O.A. STD. DWG. 2340.
5. CONSTRUCT ALL SINGLE & DOUBLE WATER SERVICES PER C.O.A. STD. DWGS. #2360, #2361, #2362 & #2363. WATER SERVICES SHALL BE 3/4".
6. CONSTRUCT 4" SAS SERVICES PER C.O.A. STD. DWG. #2125.
7. CONSTRUCT TYPE "E" MANHOLES PER COA STD. DWG. 2102. TYPE "C" MANHOLES PER C.O.A. STD. DWG. 2101 MAY BE USED IN LIEU OF TYPE "E" MANHOLE.
8. CONSTRUCT TYPE "A" INLETS PER COA STD. DWGS. 2201 & 2202.
9. CONSTRUCT TYPE "C" INLETS PER COA PER COA STD. DWG. 2205.

KEYED NOTES

1. 22 LF SD @ S=0.0550 FT/FT FROM MH. 1 – 11° BEND & 28.69 LF SD @ S=0.1977 FT/FT TO INLET
2. 50.00 LF SD @ S = 0.0200 FT/FT
3. 5.66 LF SD @ S = 0.0500 FT/FT
4. 18 LF SD @ S=0.1000 FT/FT FROM MH. 1 – 23° BEND & 16 LF SD @ S=0.3169 FT/FT TO INLET
5. 34.00 LF SD @ S = 0.0200 FT/FT
6. SEE SHEET 5 FOR SD LATERAL DETAIL

ALL STORM DRAIN LATERALS ARE 18" RCP SD, CLASS IV UNLESS OTHERWISE NOTED.

CONNEMARA AVE. SEWER SERVICES				
BLK.	LOT	STATION	INVERT @ P.L.	LENGTH/ RISER
3	36	5+30.56	80.56	21.8/4.6
7	10	10+33.5	57.76	21.5/4.9
7	11	9+98.24	58.92	21.9/4.4
7	12	9+42.00	60.70	22.4/3.7
7	13	8+90.28	62.75	22.5/3.6
7	14	8+38.51	65.11	22.2/3.9
7	15	7+86.77	67.48	22.0/4.3
7	16	7+35.02	69.85	21.7/4.6
7	17	6+83.16	72.23	21.7/4.7
7	18	6+30.55	74.64	21.7/4.7
8	18	4+77.50	82.65	20.7/6.1
8	19	5+37.07	79.92	20.7/6.1
8	20	5+85.64	77.69	20.7/6.1
8	21	6+48.70	74.81	20.7/6.1
8	22	7+05.77	72.19	20.6/6.3
8	23	7+62.83	69.58	20.9/5.9
8	24	8+19.90	66.97	21.1/5.5
8	25	8+76.96	64.35	21.4/5.1
8	26	9+34.02	62.03	21.4/5.2

26-5495.82 11/98

URS Greiner
5971 JEFFERSON BLVD. NE
SUITE 101
ALBUQUERQUE, NM 87109
(505) 345-3999

AS BUILT INFORMATION
CONTRACTOR NEW CONCEPTS DATE 11/97
STAKED BY COA
INSPECTED BY RAY BACA DATE 11/97
FIELD VERIFICATION BY COA DATE 11/97
DRAWINGS CORRECTED BY URS GREINER DATE 12/97

MICRO-FILM INFORMATION
RECORDED BY / DATE

BENCH MARKS
ACS 18-L8, LOCATED ON TOP OF CONCRETE BASE OF STREET LIGHT STANCHEON EAST OF TANAGER DR. SW, 0.20 MI. + SOUTHWESTERLY OF CENTERLINE OF BLDG. # 736 TANAGER DR. SW. EPOXIED ON WEST SIDE OF SAID CONC. BASE. ELEV. = 5253.59

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
5/16/97
GREINER PROJECT NO. E3008727

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY: LSJ DATE: 5/97
DRAWN BY: RDJ DATE: 5/97
CHECKED BY: MSH/DM DATE: 5/97

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

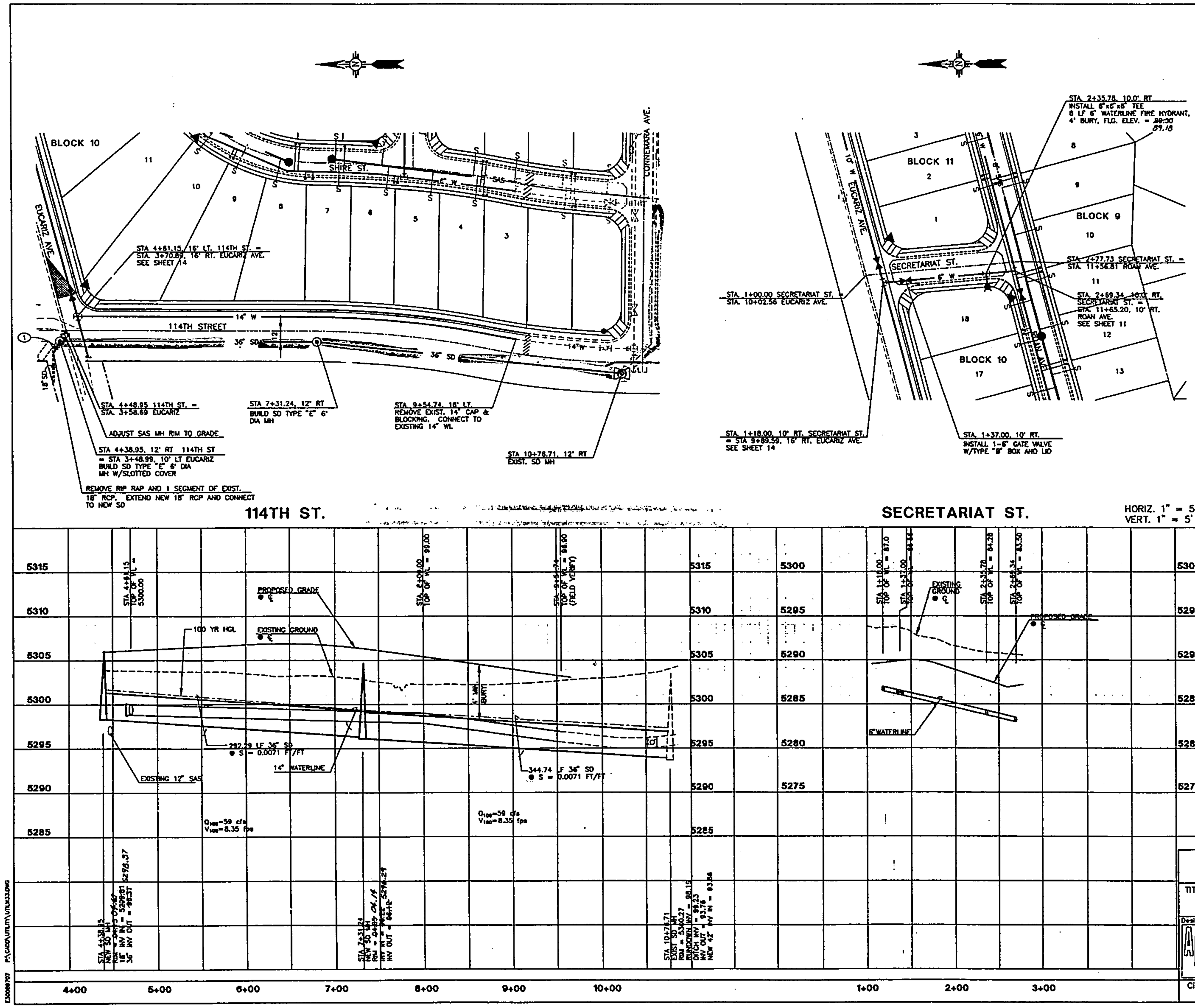
TITLE: SUNRISE TERRACE WEST, UNIT 2
CONNEMARA AVE.
UTILITY PLAN AND PROFILE

Design Review Committee | City Engineer Approval | Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.
JUL 30 1997

City Project No. 549582 | Zone Map No. L-8 | Sheet 11 Of 12

200618

CITY OF ALBUQUERQUE



GENERAL NOTES

1. ALL STATIONING REFERS TO STREET CENTERLINE.
2. ALL FITTINGS AND VALVES ON WATERLINES SHALL HAVE RESTRAINED JOINTS PER THE SCHEDULE ON DETAIL SHEET 5.
3. CONSTRUCT SAS SERVICES PER C.O.A. STD. DWG. #2125.
4. CONSTRUCT FIRE HYDRANTS PER C.O.A. STD. DWG. 2340.
5. CONSTRUCT ALL SINGLE & DOUBLE WATER SERVICES PER C.O.A. STD. DWGS. #2350, #2361, #2362 & #2363. WATER SERVICES SHALL BE 3/4".
6. CONSTRUCT VALVE BOXES PER COA STD. DWG. #2326, TYPE "B".
7. CONSTRUCT TYPE "A" INLET PER COA STD. DWGS. #2201 & #2202.
8. CONSTRUCT TYPE DOUBLE "C" INLET PER COA STD. DWGS. #2205.
9. CONSTRUCT TYPE "E" MANHOLES PER COA STD. DWG. 2102. TYPE "C" MANHOLES PER C.O.A. STD. DWG. 2101 MAY BE USED IN LIEU OF TYPE "E" MANHOLE.

KEYNOTES

(1) 15.27 LF 16" RCP SD @ S = 0.1009 FT/FT

RECORD DRAWINGS

THESE DRAWINGS HAVE BEEN REVISED TO REFLECT AS-CONSTRUCTED CONDITIONS IN ACCORDANCE WITH INFORMATION FURNISHED BY COA WHICH PERFORMED ON-SITE INSPECTION AND SURVEY DURING CONSTRUCTION.

6/8/98

URS Greiner
5971 JEFFERSON BLVD. NE
SUITE 101
ALBUQUERQUE, NM 87109
(505) 345-3999

AS BUILT INFORMATION — CONTRACTOR NEW CONCEPTS DATE 3/98

BENCH MARKS

SURVEY INFORMATION — FIELD NOTES

ENGINEER'S SEAL

DESIGNED BY: LSJ DATE: 5/97
DRAWN BY: JAK DATE: 5/97
CHECKED BY: MSH/DM DATE: 5/97

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

TITLE: SUNRISE TERRACE WEST, UNIT 3
114TH ST. AND SECRETARIAT ST.
UTILITY PLAN AND PROFILE

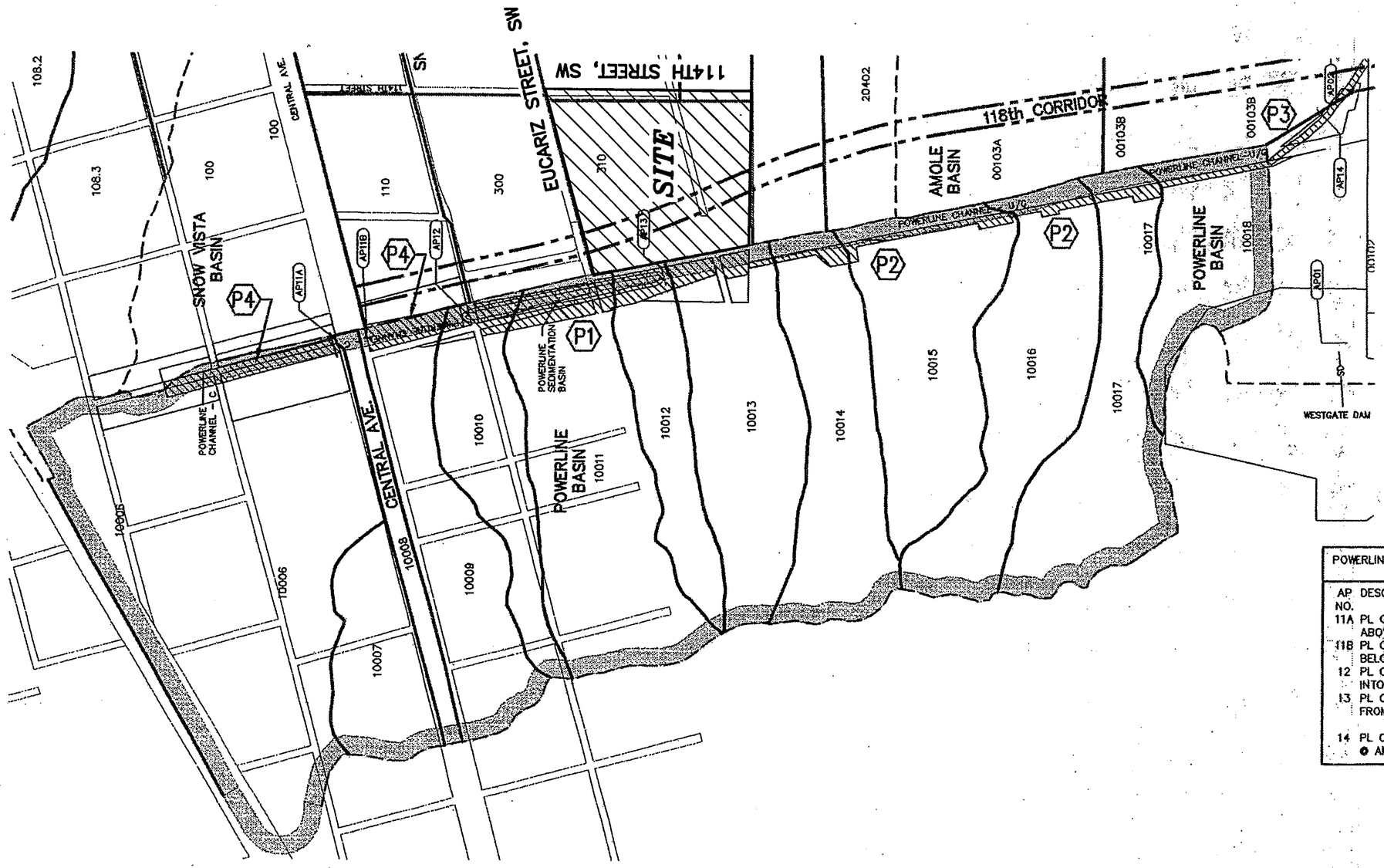
Design Review Committee: APPROVED JUL 24 1997 DESIGN REVIEW COMMITTEE
City Engineer Approval

City Project No.	Zone Map No.	Sheet	Of
549583	L-8	13	15

D 24 C 20 B 16 A 12

CITY OF ALBUQUERQUE

018



POWERLINE BASIN MANAGEMENT PLAN

PROJECT PL1

P1 INCREASE POWERLINE SEDIMENTATION DETENTION BASIN FROM 28 AF TO 46 AF

P2 IN-LINE DETENTION BASINS~ 4 TO 8 AF EACH, 58 AF TOTAL SEE FIGURE III-4

P3 FLOW INTO AMOLE ARROYO~ 20 cfs

PROJECT PL2

P4 CHANNEL FREEBOARD UPGRADE.

POWERLINE BASIN (PL)	EXISTING FACILITIES (DEVEX)		WITH DMP	
AP NO.	DESCRIPTION	VARIABLE	100 YR 24 HR.	VARIABLE	100 YR 24 HR.
11A	PL CHANNEL ABOVE CENTRAL	Q cfs	577	Q cfs	577
		TVol AF	25.2	TVol AF	25.2
11B	PL CHANNEL BELOW CENTRAL	Q cfs	716	Q cfs	716
		TVol AF	31.4	TVol AF	31.4
12	PL CHANNEL INTO SED. BASIN	Q cfs	890	Q cfs	890
		TVol AF	39.5	TVol AF	39.5
13	PL CHANNEL FROM SED. BASIN	Q cfs	431	Q cfs	19
		TVol AF	58.7	TVol AF	58.2
		DVol AF	28.2	DVol AF	44.9
14	PL CHANNEL @ AMOLE ARROYO	Q cfs	941	Q cfs	20
		TVol AF	99.8	TVol AF	98.1

N

0 500' 1000' 2000'

1" = 1000'±

LEGEND

- DMP IMPROVEMENTS
- BASIN BOUNDARIES
- LOCATION STUDY CORRIDOR
- SUBBASIN BOUNDARIES
- (APXX) HYDROLOGIC ANALYSIS POINT
- BASIN BOUNDARY THIS SHEET
- 60110 SUBBASIN ID NUMBER
- (SVX) PROJECT ID NUMBER

AMOLE-HUBBELL D.M.P.

POWERLINE BASIN MANAGEMENT PLAN

FIGURE NO. III-3