CITY OF ALBUQUERQUE

December 17, 2010

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: West Ridge MH Park Detention Pond
Grading and Drainage Plan
Engineer's Stamp dated 12-10-10 (K9-D006)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 12-13-2010, the above referenced plan is approved for Grading Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology along with a private facilities maintenance agreement.

A separate Work Order permit is required for construction within the city right of way.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge.

This project also requires a Topsoil Disturbance Permit since it is disturbing ¾ of an acre or more.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, P.E., C.F.M.
City Hydrologist, Planning Department
Development and Building Services

C: File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: West Ridge Mobile Home Park Detention Pond
ZONE MAP/DRG. FILE # K9-Z [illegible]
DRB #: 1000248
EPC #:
WORK ORDER #:

LEGAL DESCRIPTION: Tract A, West Ridge Mobile Home Park
CITY ADDRESS: 9301 Volcano Road NW, Albuquerque, New Mexico 87121

ENGINEERING FIRM:	Tierra West, LLC	CONTACT:	Jonathan Niski
ADDRESS:	5571 Midway Park Place NE	PHONE:	(505) 858-3100
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
OWNER:	Fred N. Seeley	CONTACT:	Fred Seeley
ADDRESS:	P.O. Box 65598	PHONE:	(505) 888-9777
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87193
ARCHITECT:	N/A	CONTACT:	N/A
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
SURVEYOR:	Precision Surveys Inc.	CONTACT:	Larry Medrano
ADDRESS:	P.O. Box 90636	PHONE:	(505) 856- 5700
CITY, STATE:	Albuquerque, New Mexico	ZIP CODE:	87199
CONTRACTOR:	N/A	CONTACT:	N/A
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

- ___ DRAINAGE REPORT
- X DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEERS CERTIFICATION (TCL)
- ___ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA / FINANACIAL 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.)
- X GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- X SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- X NO
- ___ COPY PROVIDED

RECEIVED
DEC 13 2010
HYDROLOGY SECTION

DATE SUBMITTED: 12/13/2010 BY: Jonathan Niski, 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 sumbittal may be required based on the following:

1. **Conceptual Grading and Drainage Plans**: 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 subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

December 10, 2010

Brad Bingham, P.E.
Section Manager, City Hydrology
City of Albuquerque
Plaza Del Sol
600 N. Second Street NW
Albuquerque, NM 87102

RE: ADMINISTRATIVE AMENDMENT FOR WEST RIDGE MOBILE HOME PARK ADDITIONAL SPACES AND PERMANENT DETENTION POND.

Dear Mr. Bingham:

The purpose of this addendum is to modify the approved grading and drainage plan dated October 8, 2007 for the proposed West Ridge Mobile Home Park permanent detention pond as well as update the approved drainage report titled "West Ridge Mobile Home Park Permanent Detention Pond" dated September 7, 2007. To dated no improvements have been made to the temporary retention pond constructed with West Ridge Mobile Home Park.

Tierra West is proposing to modify the design of the permanent detention pond to accommodate the construction of 8 additional mobile home spaces. To make room the pond size was modified to allow the appropriate depth for each mobile home spaces. AHYMO analysis of the proposed pond was conducted to show that the proposed pond will handle the 100-year flood event without over topping while maintaining an allow discharge less than 56.31 cfs. Based on the updated AHYMO analysis the 100-year water service elevation for the revised pond is 5162.33 feet and a peak discharge of 56.28 cfs.

Attached are copies of the revised pond volume calculations, AHYMO inputs and outputs, StormCad Analysis of new storm sewer and the revised grading and drainage plan.

Sincerely,

Ronald R. Bohannan, P.E.

Enclosure/s

cc: Fred Seeley – Western Security Real Estate, Inc.

JN: 27031
RRB/JC/cla

Z:\2007\27031\Correspondence\27031 Brad Bingham Drainage Letter 12-10-10.doc

```
      AHYMO PROGRAM (AHYMO_97) -                          - Version:  1997.02d
            RUN DATE (MON/DAY/YR) = 12/07/2010
            START TIME (HR:MIN:SEC) = 11:13:31     USER NO.=
AHYMO-S-9702d3TierraW-AH
            INPUT FILE = Z:\2007\27031\Reports\Drainage\AHYMO\27031-~1.TXT

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

     *                WEST RIDGE MOBILE HOME PARK                 *

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

     *       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=0.02253 HR


                    COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 -
PEAK AT 1.40 HR.
                    DT =     .022530 HOURS       END TIME =     5.992981 HOURS
                       .0000   .0011   .0022   .0033   .0045   .0056   .0068
                       .0080   .0092   .0105   .0117   .0130   .0143   .0156
                       .0169   .0183   .0197   .0211   .0225   .0240   .0255
                       .0270   .0286   .0301   .0318   .0334   .0351   .0368
                       .0386   .0404   .0423   .0442   .0461   .0481   .0502
                       .0523   .0545   .0567   .0590   .0614   .0639   .0664
                       .0691   .0718   .0747   .0779   .0814   .0852   .0890
                       .0931   .1009   .1168   .1389   .1682   .2060   .2533
                       .3113   .3814   .4648   .5627   .6765   .8073   .9567
                      1.1258  1.2045  1.2601  1.3098  1.3554  1.3977  1.4374
                      1.4748  1.5103  1.5441  1.5763  1.6070  1.6365  1.6648
                      1.6919  1.7180  1.7432  1.7673  1.7906  1.8131  1.8348
                      1.8557  1.8758  1.8953  1.9141  1.9322  1.9468  1.9509
                      1.9548  1.9586  1.9623  1.9659  1.9693  1.9727  1.9759
                      1.9791  1.9822  1.9852  1.9881  1.9910  1.9938  1.9965
                      1.9992  2.0018  2.0043  2.0068  2.0093  2.0117  2.0141
                      2.0164  2.0187  2.0209  2.0231  2.0253  2.0274  2.0295
                      2.0316  2.0336  2.0356  2.0376  2.0396  2.0415  2.0434
                      2.0453  2.0471  2.0489  2.0507  2.0525  2.0543  2.0560
                      2.0577  2.0594  2.0611  2.0627  2.0644  2.0660  2.0676
                      2.0692  2.0708  2.0723  2.0738  2.0754  2.0769  2.0784
                      2.0798  2.0813  2.0828  2.0842  2.0856  2.0870  2.0884
                      2.0898  2.0912  2.0925  2.0939  2.0952  2.0965  2.0979
                      2.0992  2.1005  2.1017  2.1030  2.1043  2.1055  2.1068
                      2.1080  2.1092  2.1104  2.1117  2.1129  2.1140  2.1152
                      2.1164  2.1176  2.1187  2.1199  2.1210  2.1221  2.1233
                      2.1244  2.1255  2.1266  2.1277  2.1288  2.1299  2.1310
```

2.1320	2.1331	2.1341	2.1352	2.1362	2.1373	2.1383
2.1393	2.1404	2.1414	2.1424	2.1434	2.1444	2.1454
2.1464	2.1473	2.1483	2.1493	2.1502	2.1512	2.1522
2.1531	2.1541	2.1550	2.1559	2.1569	2.1578	2.1587
2.1596	2.1605	2.1614	2.1623	2.1632	2.1641	2.1650
2.1659	2.1668	2.1677	2.1685	2.1694	2.1703	2.1711
2.1720	2.1728	2.1737	2.1745	2.1754	2.1762	2.1770
2.1779	2.1787	2.1795	2.1803	2.1812	2.1820	2.1828
2.1836	2.1844	2.1852	2.1860	2.1868	2.1876	2.1883
2.1891	2.1899	2.1907	2.1915	2.1922	2.1930	2.1938
2.1945	2.1953	2.1960	2.1968	2.1975	2.1983	2.1990
2.1998						

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*
* BASIN 2
*
COMPUTE NM HYD       ID=2 HYD NO=100.2 AREA=0.008019 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=-0.24 HR MASS RAINFALL=-1

         K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
         UNIT PEAK =   10.551    CFS   UNIT VOLUME =    .9989       B =   526.28
  P60 = 1.8700
         AREA =      .004811 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

         K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
         UNIT PEAK =   4.7401    CFS   UNIT VOLUME =    .9970       B =   354.67
  P60 = 1.8700
         AREA =      .003208 SQ MI    IA =    .42500 INCHES    INF =   1.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

PRINT HYD            ID=1 CODE=1

                                        OUTFLOW HYDROGRAPH REACH      .00

        RUNOFF VOLUME =      .00000 INCHES     =       .0000 ACRE-FEET
        PEAK DISCHARGE RATE =       .00 CFS  AT    .000 HOURS   BASIN AREA =
.0000 SQ. MI.


*
* BASIN 3
*
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     COMPUTE NM HYD       ID=3 HYD NO=100.3 AREA=0.004474 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   5.8864    CFS   UNIT VOLUME =    .9979       B =   526.28
  P60 = 1.8700
          AREA =      .002684 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =   2.6446    CFS   UNIT VOLUME =    .9946       B =   354.67
  P60 = 1.8700
          AREA =      .001790 SQ MI    IA =    .42500 INCHES    INF =   1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD            ID=1 CODE=1

                                          OUTFLOW HYDROGRAPH REACH      .00

        RUNOFF VOLUME =      .00000 INCHES     =        .0000 ACRE-FEET
        PEAK DISCHARGE RATE =      .00 CFS  AT    .000 HOURS   BASIN AREA =
.0000 SQ. MI.


     *
     * BASIN 4
     *
     COMPUTE NM HYD       ID=4 HYD NO=100.4 AREA=0.007330 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   9.6440    CFS   UNIT VOLUME =    .9988       B =   526.28
  P60 = 1.8700
          AREA =      .004398 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
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          UNIT PEAK =    4.3329     CFS    UNIT VOLUME =     .9967        B =    354.67
  P60 = 1.8700
          AREA =       .002932 SQ MI     IA =     .42500 INCHES     INF =    1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD            ID=1 CODE=1

                                                OUTFLOW HYDROGRAPH REACH       .00

          RUNOFF VOLUME =       .00000 INCHES      =         .0000 ACRE-FEET
          PEAK DISCHARGE RATE =         .00 CFS  AT     .000 HOURS    BASIN AREA =
.0000 SQ. MI.


     *
     * BASIN 5A
     *
     COMPUTE NM HYD       ID=5 HYD NO=100.5A AREA=0.005505 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =    .130800HR     TP =    .240000HR     K/TP RATIO =    .545000      SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =    7.2429     CFS    UNIT VOLUME =     .9983        B =    526.28
  P60 = 1.8700
          AREA =       .003303 SQ MI     IA =     .10000 INCHES     INF =     .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =    .213226HR     TP =    .240000HR     K/TP RATIO =    .888442      SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =    3.2541     CFS    UNIT VOLUME =     .9956        B =    354.67
  P60 = 1.8700
          AREA =       .002202 SQ MI     IA =     .42500 INCHES     INF =    1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD            ID=1 CODE=1

                                                OUTFLOW HYDROGRAPH REACH       .00

          RUNOFF VOLUME =       .00000 INCHES      =         .0000 ACRE-FEET
          PEAK DISCHARGE RATE =         .00 CFS  AT     .000 HOURS    BASIN AREA =
.0000 SQ. MI.
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     *
     * BASIN 5B
     *
     COMPUTE NM HYD       ID=6 HYD NO=100.5B AREA=0.001121 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   1.4749    CFS   UNIT VOLUME =    .9914       B =   526.28
  P60 = 1.8700
          AREA =      .000673 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =   .66264    CFS   UNIT VOLUME =    .9786       B =   354.67
  P60 = 1.8700
          AREA =      .000448 SQ MI    IA =    .42500 INCHES    INF =   1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD            ID=1 CODE=1

                                        OUTFLOW HYDROGRAPH REACH      .00

         RUNOFF VOLUME =      .00000 INCHES     =        .0000 ACRE-FEET
         PEAK DISCHARGE RATE =       .00 CFS  AT    .000 HOURS   BASIN AREA =
.0000 SQ. MI.


     *
     * BASIN 6
     *
     COMPUTE NM HYD       ID=7 HYD NO=100.6 AREA=0.007264 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   9.5572    CFS   UNIT VOLUME =    .9988       B =   526.28
  P60 = 1.8700
          AREA =      .004358 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
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          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =   4.2939    CFS   UNIT VOLUME =    .9967       B =   354.67
  P60 = 1.8700
          AREA =      .002906 SQ MI    IA =    .42500 INCHES    INF =   1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD           ID=1 CODE=1

                                              OUTFLOW HYDROGRAPH REACH      .00

         RUNOFF VOLUME =      .00000 INCHES     =        .0000 ACRE-FEET
         PEAK DISCHARGE RATE =        .00 CFS  AT    .000 HOURS   BASIN AREA =
.0000 SQ. MI.


     *
     * BASIN 7
     *
     COMPUTE NM HYD      ID=8 HYD NO=100.7 AREA=0.006842 SQ MI
                         PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                         TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   9.0019    CFS   UNIT VOLUME =    .9987       B =   526.28
  P60 = 1.8700
          AREA =      .004105 SQ MI    IA =    .10000 INCHES    INF =    .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530


          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =   4.0444    CFS   UNIT VOLUME =    .9966       B =   354.67
  P60 = 1.8700
          AREA =      .002737 SQ MI    IA =    .42500 INCHES    INF =   1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD           ID=1 CODE=1

                                              OUTFLOW HYDROGRAPH REACH      .00
```

```
        RUNOFF VOLUME =       .00000 INCHES     =         .0000 ACRE-FEET
        PEAK DISCHARGE RATE =         .00 CFS  AT     .000 HOURS   BASIN AREA =
.0000 SQ. MI.


     *
     * BASIN 8
     *
     COMPUTE NM HYD       ID=9 HYD NO=100.8 AREA=0.002367 SQ MI
                          PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                          TP=-0.24 HR MASS RAINFALL=-1

          K =   .130800HR    TP =   .240000HR    K/TP RATIO =   .545000     SHAPE
CONSTANT, N =  7.106420
          UNIT PEAK =   3.1142    CFS   UNIT VOLUME =    .9959       B =   526.28
  P60 = 1.8700
          AREA =       .001420 SQ MI    IA =     .10000 INCHES    INF =     .04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

          K =   .213226HR    TP =   .240000HR    K/TP RATIO =   .888442     SHAPE
CONSTANT, N =  3.992480
          UNIT PEAK =   1.3992    CFS   UNIT VOLUME =    .9898       B =   354.67
  P60 = 1.8700
          AREA =       .000947 SQ MI    IA =     .42500 INCHES    INF =   1.04000
INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.022530

     PRINT HYD            ID=1 CODE=1

                                          OUTFLOW HYDROGRAPH REACH      .00

        RUNOFF VOLUME =       .00000 INCHES     =         .0000 ACRE-FEET
        PEAK DISCHARGE RATE =         .00 CFS  AT     .000 HOURS   BASIN AREA =
.0000 SQ. MI.


     *
     *
     ADD HYD              ID=10 HYD NO=100.9 ID I=2 ID II=3
     *
     ADD HYD              ID=11 HYD NO=100.10 ID I=10 ID II=4
     *
     ADD HYD              ID=12 HYD NO=100.11 ID I=11 ID II=5
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*
ADD HYD              ID=13 HYD NO=100.12 ID I=12 ID II=6
*
ADD HYD              ID=14 HYD NO=100.13 ID I=13 ID II=7
*
ADD HYD              ID=15 HYD NO=100.14 ID I=14 ID II=8
*
ADD HYD              ID=16 HYD NO=100.15 ID I=15 ID II=9
*
PRINT HYD            ID=16 CODE=1

                                   PARTIAL HYDROGRAPH   100.15

     RUNOFF VOLUME =     1.50542 INCHES      =       3.4461 ACRE-FEET
     PEAK DISCHARGE RATE =      71.95 CFS  AT   1.622 HOURS   BASIN AREA =
.0429 SQ. MI.

*
ROUTE RESERVOIR      ID=17 HYD NO=200 INFLOW ID=16 CODE=24
                     OUTFLOW(CFS)      STORAGE(AC-FT)   ELEVATION(FT)
                          0.0000            0.0000          53.69
                          7.7949            0.0004          55.00
                         22.0153            0.0007          56.00
                         30.1427            0.0116          57.00
                         36.5034            0.0404          58.00
                         41.9095            0.0845          59.00
                         46.6939            0.1452          60.00
                         51.0317            0.2201          61.00
                         55.0286            0.3068          62.00
                         58.7542            0.4067          63.00

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

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

27031-Pond_12-7-2010.OUT

.00	.00	53.69	.000	.00
.54	.00	53.69	.000	.00
1.08	.00	53.69	.000	.00
1.62	71.95	61.10	.229	51.45
2.16	18.95	55.79	.001	18.96
2.70	4.09	54.38	.000	4.10
3.24	1.57	53.95	.000	1.57
3.79	.73	53.81	.000	.73
4.33	.48	53.77	.000	.48
4.87	.42	53.76	.000	.42
5.41	.45	53.77	.000	.45
5.95	.50	53.77	.000	.50
6.49	.08	53.70	.000	.08
7.03	.02	53.69	.000	.02

PEAK DISCHARGE = 56.284 CFS - PEAK OCCURS AT HOUR 1.76
MAXIMUM WATER SURFACE ELEVATION = 62.337
MAXIMUM STORAGE = .3405 AC-FT INCREMENTAL TIME= .022530HRS

*

*

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:13:31

K9-D6

DRAINAGE REPORT
FOR

West Ridge Mobile Home Park
Permanent Detention Pond
City of Albuquerque, New Mexico

Prepared by:

Tierra West, LLC
5571 Midway Park Place
Albuquerque, New Mexico 87109

Prepared for:
Fred N. Seeley
Western Security Real Estate, Inc.
3511 Carlisle NE
PO Box 65598
Albuquerque, NM 87193

September 7, 2007

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.

RONALD RAY BOHANNAN NEW MEXICO 7868 REGISTERED PROFESSIONAL ENGINEER

9/10/07

Ronald R. Bohannan
PE No. 7868

RECEIVED
SEP 10 2007
HYDROLOGY SECTION

Job No: 27031

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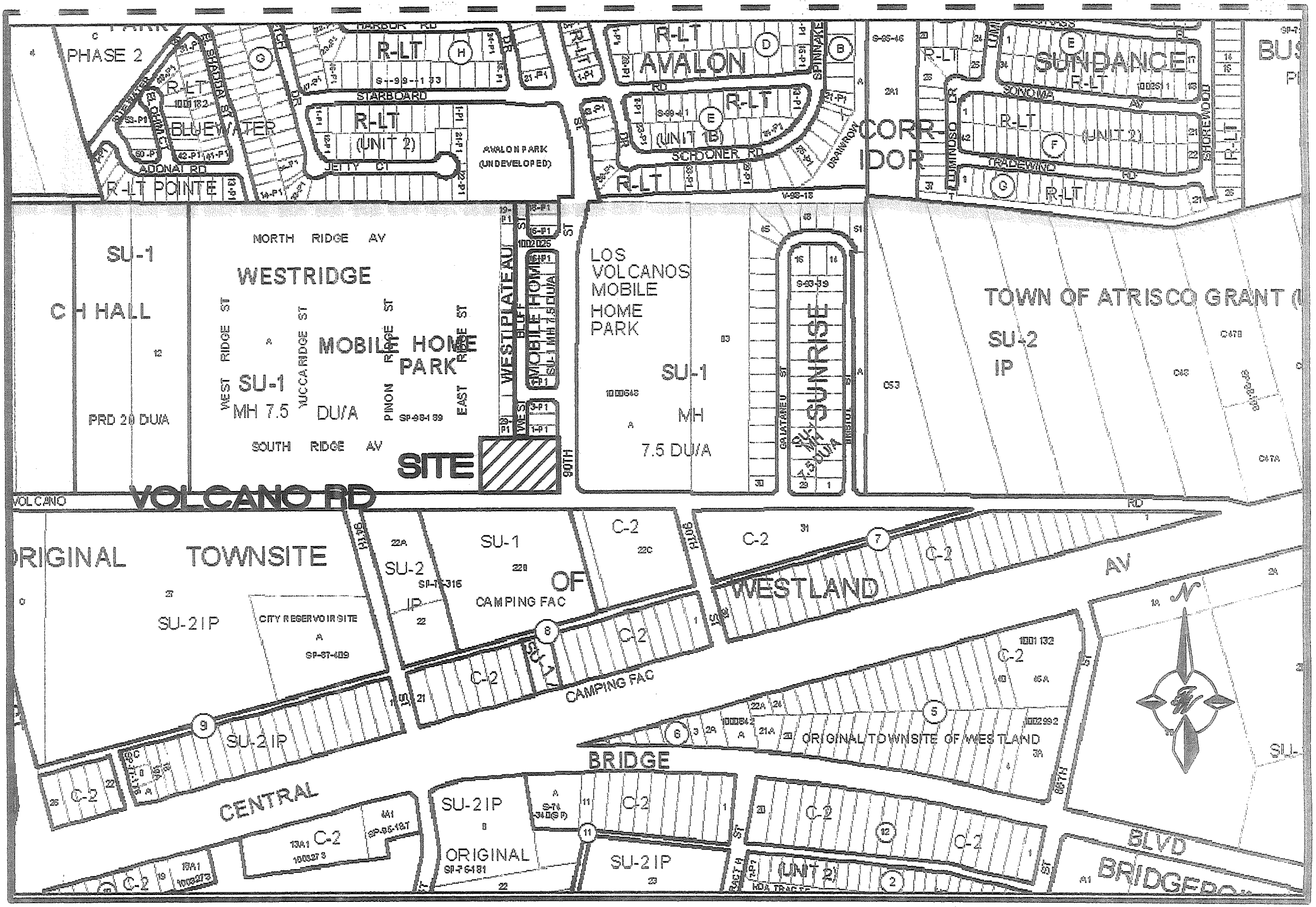
LIST OF APPENDICES

MAP POCKET



VICINITY MAP:

K-9-Z

Location

The existing West Ridge Mobile Home Park community is located south of Avalon Road between 90th and 94th Streets. The site is shown on the attached Zone Atlas Map (K-9). The purpose of this report is to connect the site to the City approved outfall eliminating the two temporary on-site retention ponds and replacing them with a permanent detention pond.

Background

The approved drainage report for the West Ridge Mobile Home Park dated January 1, 1998 outlined the necessary drainage improvements needed to develop the mobile home park. The report called for two temporary on-site retention ponds (Ponds 2A and 2B) two be constructed to capture on-site and off-site follows. The temporary retention ponds were to remain until the design and construction of the downstream storm drain improvements were complete. The purpose of this report is to provide drainage analysis supporting the construction of the permanent detention facility outlined in the approved *West Ridge Mobile Home Park Drainage Report, dated January 1, 1998* based on the completion of the downstream drainage facilities. The approved drainage report for the mobile home park determined that the maximum allowable discharge for the development is 56.31 cfs. The construction of the permanent detention pond will allow for the existing temporary retention ponds to be filled and the space used for recreation and storage facilities for the West Ridge Mobile Home Park community. A copy of the approved drainage report for the mobile home park can be found in Appendix A of this report.

Onsite Drainage Plan

With the construction of the downstream storm drain facilities along Volcano Road and 94th street the existing temporary onsite retention ponds (Ponds 2A & 2B) can be filled and replaced with a permanent detention pond located on the southeast corner of the property using a portion of Pond 2A. The remaining portion of Pond 2A not used for the detention pond will then be filled and used as a storage area for mobile home park residences. Pond 2B will be completely filled and used for recreation. The existing 18"

RCP from Pinon Ridge Street to Pond 2B will be abandoned and the existing 18" RCP running south along Pinon Ridge Street from the existing drop inlets will be unplugged allowing the captured flow to go south to South Ridge Avenue existing 24" RCP. The existing outlet pipe from the manhole at the intersection of East Ridge Street and South Ridge will be removed. Captured flow within the existing 24" RCP along South Ridge Avenue will drain to a new double Type C Inlet through a new 30" RCP. The double Type C Inlet is located in a sump and will capture the runoff from Basins 3, 5B, 6, and portions of 7 not captured by inlets along South Ridge Avenue. The total runoff at the inlet is 30.2 cfs. The double Type C Inlet has a capacity of 28.56 cfs. Minimal ponding will occur around the inlet. A new 36-inch RCP will be constructed from the new double Type C Inlet to the permanent detention pound. The new storage area (Basin 8) will surface drain to a concrete run down and outfall into the proposed detention pond.

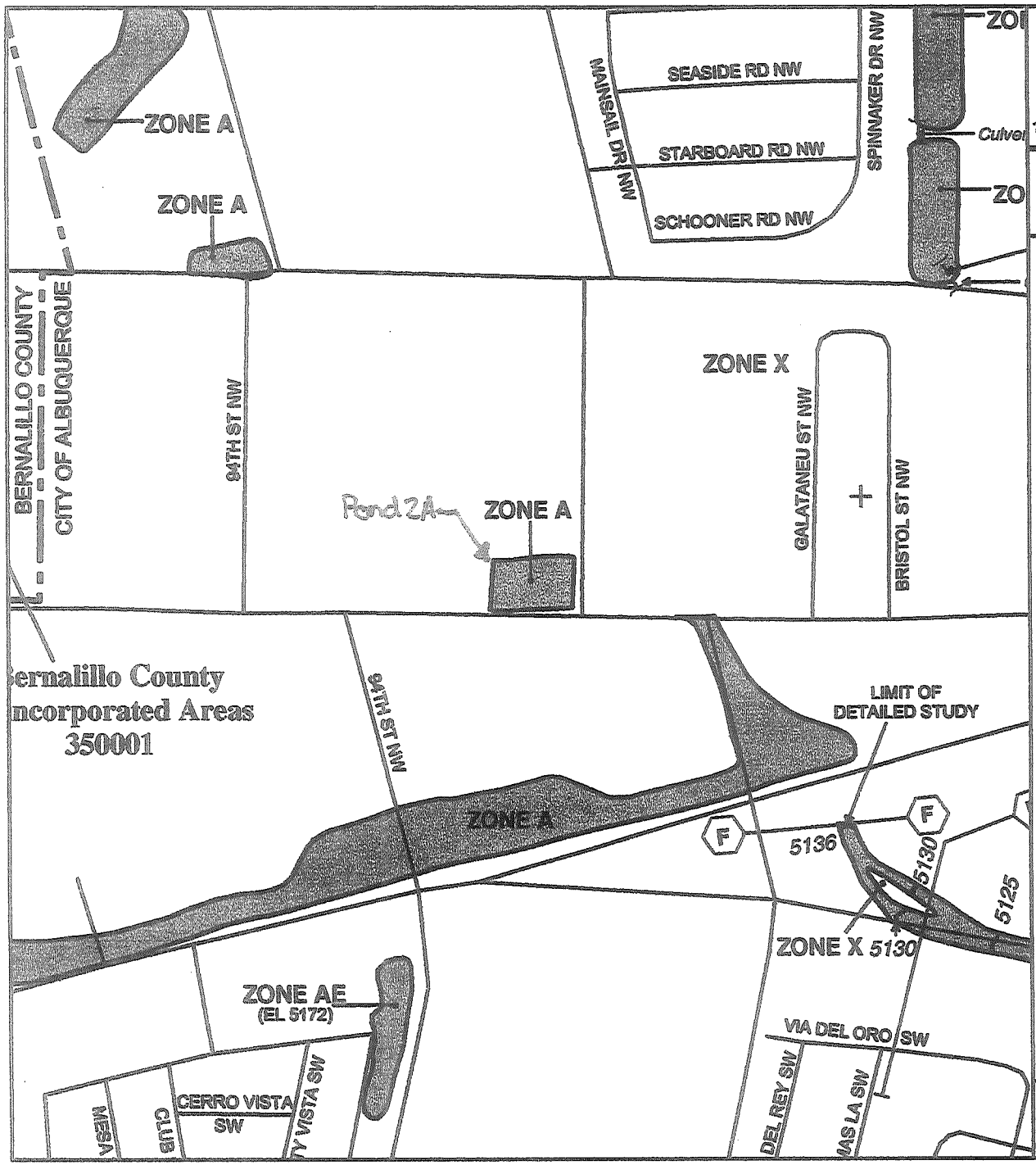
The existing 42 RCP along East Ridge Street will remained plugged. The proposed detention pond will discharge to the existing storm drain along Volcano Road through a 30" RCP line at a flow of 55.34 cfs. Detention pond calculations were done using the AHYMO (Arid –Lands Hydrologic Model) Computer Program, August 1997. Please see Appendix C and D for the pond volume calculations and pond routing input and output data. The connection to the storm drain will be made by adding a manhole along Volcano Road.

FEMA Map

The site is located on FIRM Map 35001C0328E as shown on the attached excerpt. The Map shows that Pond 2A lies within the 100 year flood plain. Following the construction of the proposed improvements a Letter of Map Revision (LOMR) will be submitted for the existing pond area to remove the portion not being used for the permanent detention pond from the flood plain.

SUMMARY

The completed construction of the storm drain along Volcano Road and 90th Street removes the need for the temporary retention Ponds 2A and 2B as described in the approved Drainage Report for West Ridge Mobile Home Park dated January 1, 1998. The two temporary retention ponds will be filled and a permanent detention pond will be built on a portion of the land used for Pond 2A. The detention pond will discharge flow into the existing storm drain system along Volcano Road using a 30" RCP at a flow of 55.34 cfs. This flow is less than the maximum allowable discharged flow of 56.31 calculated in the approved drainage report for the property. The connection to the Volcano Road storm drain will be made by constructing a new manhole within Volcano Road. Upon completion of the proposed improvements a "Letter of Map Revision" will be submitted removing the ponds from the 100 year flood plain.



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

PANEL 0328E

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 328 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0328	E
BERNALILLO COUNTY	350001	0328	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0328E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

APPENDIX A

(Copy of Approved Drainage Report)

DRAINAGE REPORT

for

West Ridge Mobile Home Park

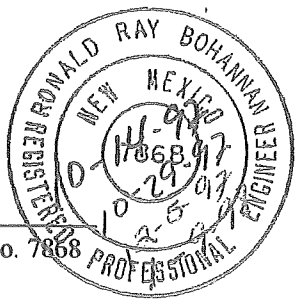
Prepared by

Tierra West, LLC
4421 McLeod Road NE, Suite D
Albuquerque, New Mexico 87109

Prepared for

Fred Seeley
Great Western Realty
3511 Carlisle Blvd, NE
Albuquerque, New Mexico 87107

October 1997



Ronald R. Bohannan P.E. No. 7868

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GRAPHIC SCALE IN FEET

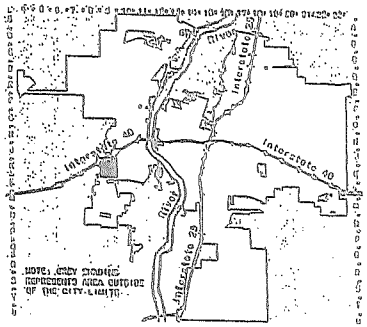
250 0 500 1000

City of Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

Map Amended through February 17, 1997



LEGAL DESCRIPTION

TION

RGE

SEC 29

UNIFORM PROPERTY CODE

1-000-057

K-9-Z

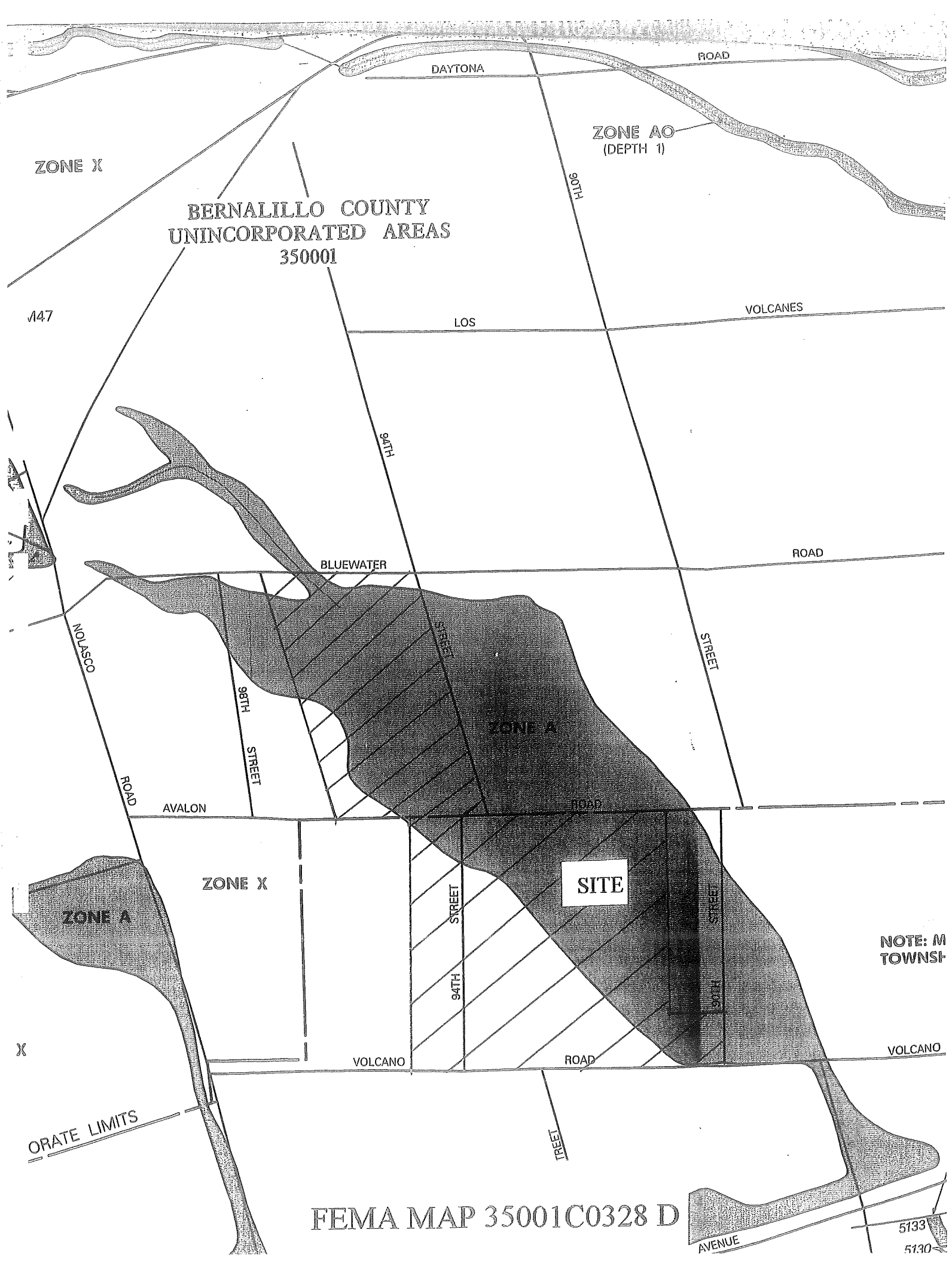
Location

West Ridge Mobile Home Park is located south of Avalon Road between 90th and 94th Streets. The site is shown on the attached Zone Atlas Map (K-9) and contains approximately 27.4 acres. The site is identified as Tracts 6, 7, 8, 9, 10, and 11 of C.H. Hall. The purpose of this report is to provide the drainage analysis and management plan for the mobile home park. An RV park is Phase II of the project and is included to the north of the mobile home park. The drainage solution for the RV park is provided here although it is conceptual and a detailed report will be provided when the park is developed.

FEMA Map and Soil Conditions

The site is located on FIRM Map 35001C0328 D as shown on the attached excerpt. The map shows that the site lies within a 100 year flood plain. A Letter of Map Revision (LOMR) will be submitted for the site that will remove the 100 year flood plain. The LOMR will only affect the flood plain downstream of the site and will not remove the flood plain north of the site. Future upstream development will have to submit additional LOMRs after upstream improvements are constructed. The residents of the site will be required to acquire flood insurance until improvements are constructed that remove the flood plain and the LOMR is approved.

The site contains two different soils from the Soil Conservation Service Soil Survey of Bernalillo County. The first is a Pajarito loamy fine sand which has moderately rapid permeability. The second soil is a Bluepoint loamy fine sand and has rapid permeability. Runoff is slow and the hazard of soil blowing is severe for both soils.



FEMA MAP 35001C0328 D

Off-site Drainage Management Plan

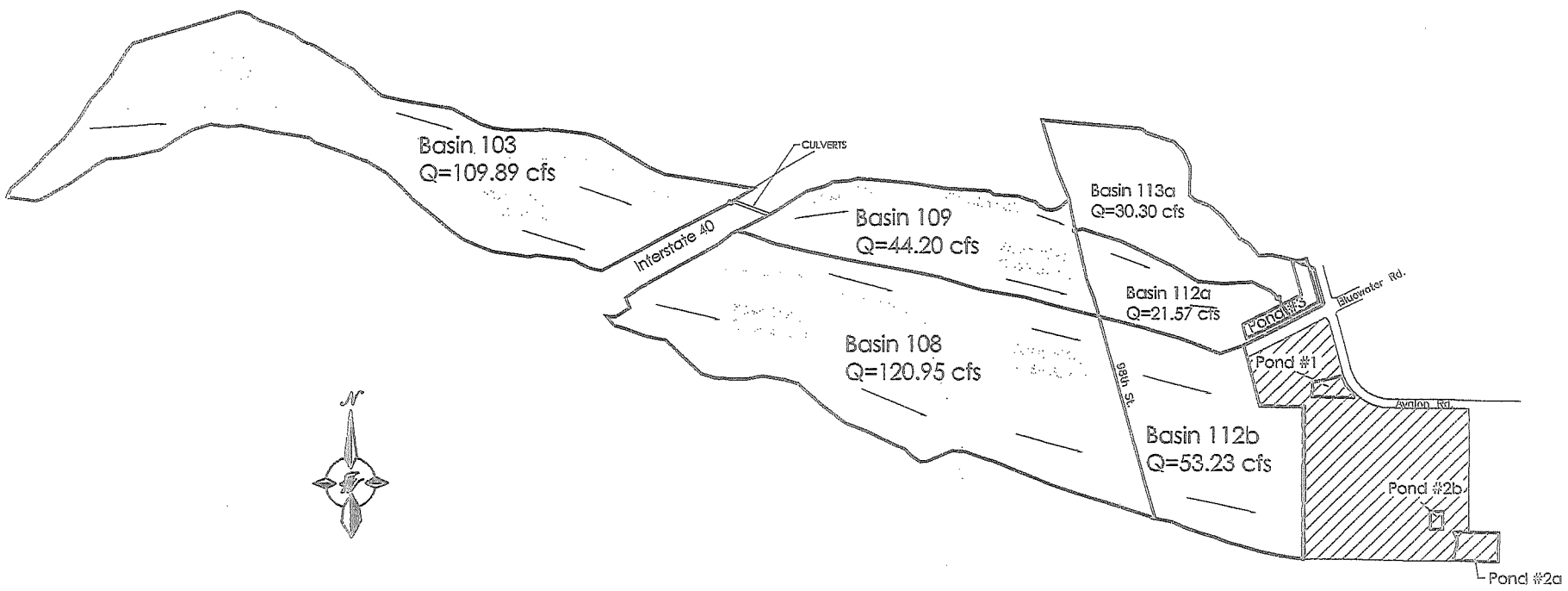
The site is currently undeveloped and drains to the southeast with 44.27 cfs of undeveloped runoff. The offsite undeveloped flows impacting the site have been divided into six basins, Basins 103, 108, 109, 112a, 112b, and 113a. These six basins consist of several smaller basins that were used for ease in computation but are not needed for narrative purposes. Basin 103 consists of basins 103a and 103b. Basin 108 consists of basins 108.1 and 109a. Basin 109 consists of basins 109b and 110. (see attached exhibit). These basins directly impact the site from the northwest.

Undeveloped flows that consist of Basins 103, 109, 112a, 113a will be cut off from the site by Bluewater Road. This undeveloped offsite flow will be ponded in an temporary off-site pond north of Bluewater Road and west of 94th Street (Pond 3). Pond 3 will be designed for the undeveloped upstream runoff. The pond will not have capacity for developed flows and is not intended as an outfall for upstream basins. Offsite Basins 108, and 112b will be captured in a proposed 48" RCP storm sewer in Volcano Road and routed to a proposed retention pond on the mobile home park site (Pond 2a).

In the future, the developed flows from the west will be cut off by Interstate 40 and 98th Street. The temporary retention ponds will be removed and the proposed storm sewer will be designed for the developed flows east of 98th Street.

Interim Solution

Basin 103 consists of the area west of Interstate 40. Basin 103 has an undeveloped runoff of 109.89 cfs . This basin flows southeast and passes under the Interstate through a series of existing culverts. The runoff will be detained in a temporary off-site retention pond located north of Bluewater Road (Pond 3). In the future, the developed runoff from Basin 103 will not affect the site as it will be contained at the Interstate with the I-40 Interceptor Project.



Off-Site Undeveloped Basin Layout

Basins 109 is located between Interstate 40 and 98th Street. Basin 109 has an undeveloped runoff flow of 44.20 cfs. This basin drains southeast towards the site and will be contained in the same temporary off-site retention pond (Pond 3) located north of Bluewater Road (Pond 3). In the future, Basin 109 will be intercepted by 98th Street and will not affect the site.

Basin 112a will have an undeveloped runoff of 21.57 cfs and is located between 98th Street and the site. This runoff will be captured in the temporary retention pond (Pond 3) located north of Bluewater Road.

Basin 113a will have an undeveloped runoff of 30.30 cfs and is located north of basin 112a and east of 98th Street. The basin consists of the northern portion of the floodplain impacting the site. This runoff and the floodplain will be captured in the temporary retention pond (Pond 3) located north of Bluewater Road.

The proposed off-site retention pond (Pond 3) is located north of Bluewater Road. It will collect a total flow of 205.96 cfs. The pond has a capacity of 6.46 ac-ft which is greater than the required capacity of 5.86 ac-ft. In the event of an emergency, the runoff will overflow from a 70.0 foot wide spillway. The pond will be removed after 98th Street is improved and the offsite basins intercepted.

Basin 108 drains east towards the site and is too far south to be captured in the temporary retention pond near Bluewater Road. Basin 108 has an undeveloped runoff of 120.95 cfs. This basin will sheet flow east until it reaches the western edge of the mobile home park and is directed south to Volcano Road via a waterproofed wall. The flows will then be conveyed to Volcano Road and captured in a cattleguard inlet. The proposed 48" RCP storm drain in Volcano Road has been designed to have capacity for the undeveloped flows from west of the site. The 48" RCP storm drain will transport the off-site flows to a proposed on-site temporary retention pond (Pond 2a). In the future, Basin 108 will be intercepted by

improvements in 98th Street and will no longer affect the site.

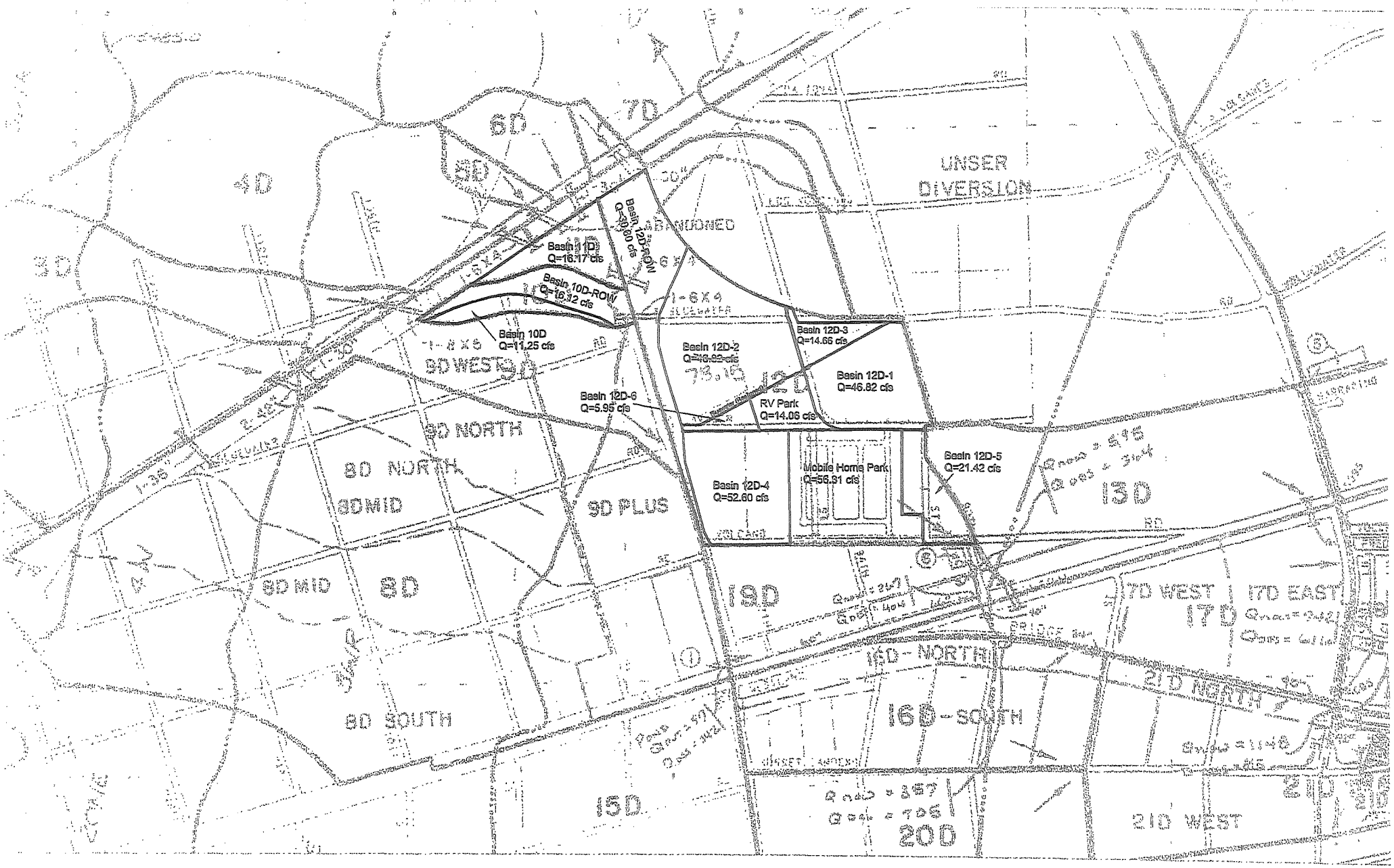
Basin 112b will flow east with an undeveloped runoff of 53.23 cfs. This basin is located between 98th Street and the site, and south of Basin 112a. Basin 112b will be captured by the storm drain in Volcano Road and conveyed to the proposed on-site retention pond (Pond 2a).

Offsite basins 108, and 112b will drain to a proposed on-site retention pond (Pond 2a) located in the southeast corner of the mobile home park. A total of 10.43 ac-ft of volume from the undeveloped off-site flows and the developed on-site flows must be ponded on the site. There will be a large pond (Pond 2a) in the southeast corner of the mobile home park and a second smaller pond (Pond 2b) located near the basketball court in the center of the site. Pond 2a will have a capacity of 9.9813 ac-ft and Pond 2b will have a capacity of 0.49 ac-ft. These two ponds total 10.47 ac-ft which is greater than the 10.43 required. In the event of an emergency, the runoff from Pond 2a will overflow from a 90.0 foot wide spillway.

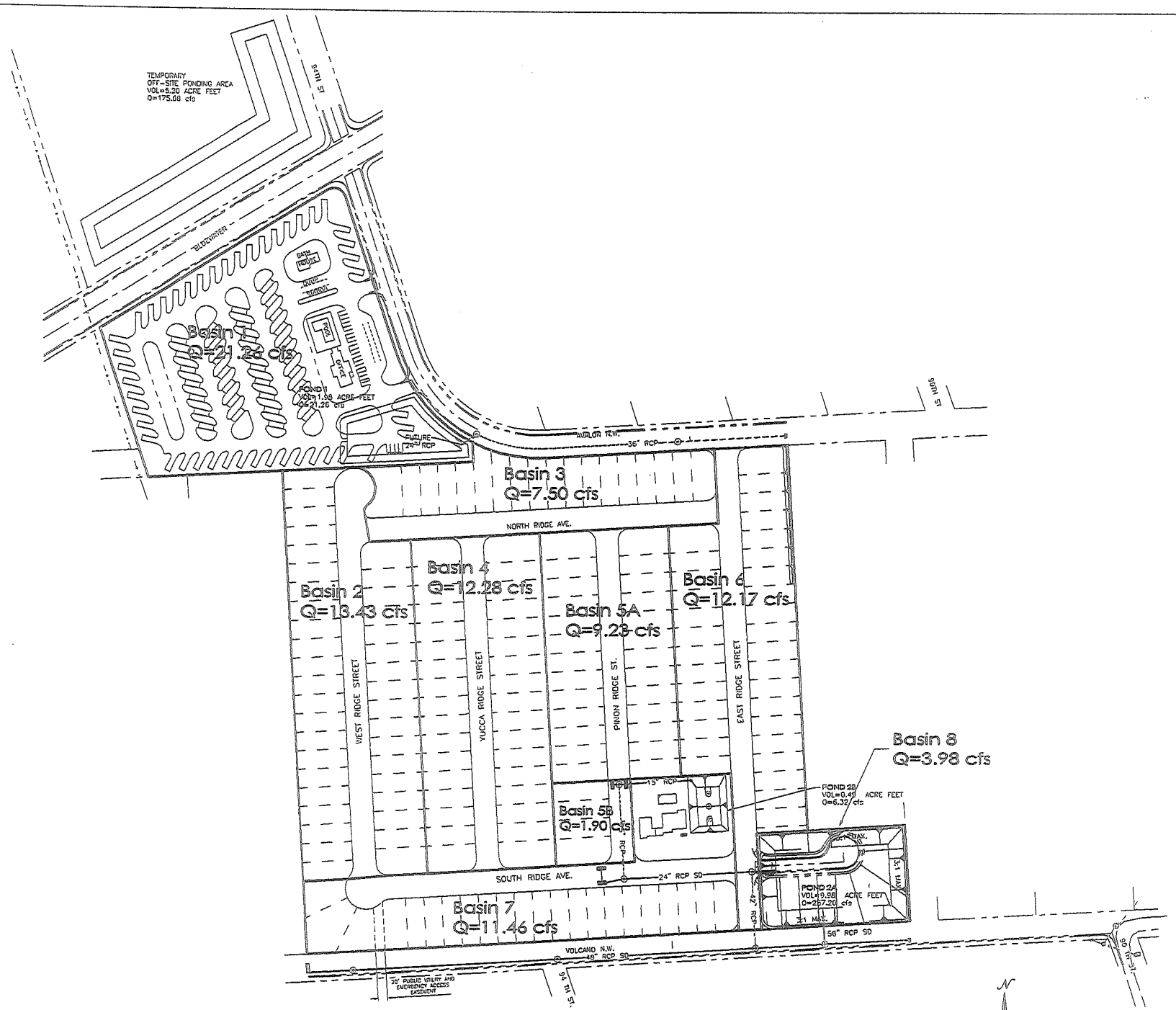
The proposed 48" RCP storm drain in Volcano Road has been designed to carry the undeveloped flow of 174.18 cfs from the offsite basins to the retention pond (Pond 2a). A cattle guard inlet will capture the offsite flows as they enter Volcano Road at the west end of the mobile home park. In the future, when downstream improvements are constructed, the on-site retention ponds will be removed and a permanent detention pond constructed. The upstream basins will be cut off at 98th Street when upstream improvements are constructed. The storm drain in Volcano Road will be required to convey the offsite developed basin 12D-4 with a developed runoff flow of 52.60 cfs and the controlled discharge from the site of 56.31 cfs, which is a total of 108.91 cfs.

Future Solution

The developed future basins are based on the City of Albuquerque's long range storm sewer plan for the 98th Street and I-40 area. According to this plan, the site is located within



City of Albuquerque Developed Basin Map
Sub-basins for Storm Sewer Analysis



Developed Basin Layout

Basin 12D (see attached developed offsite basin map). Basins 10D and 11D are routed through Basin 12D. Basin 10D and 11D are located northwest of the site between 98th Street and I-40. Basin 12D includes the area north of the site all the way to I-40. These three basins flow to a proposed 66" storm drain in 90th Street.

The original hydrology for the proposed storm drain in 90th Street estimated the flow from Basins 10D, 11D, and 12D to be 364 cfs. New hydrology for the area estimates the developed runoff for the area as 595 cfs. The proposed 66" RCP in 90th Steet was designed using the old hydrology and will not have capacity for the new runoff flow of 595 cfs. The City of Albuquerque has made no provisions for the discrepancy. For the purposes of this report, we have assumed each tract will be required to detain the difference in flows onsite. A portion of each basin is right-of-way belonging to the State Highway Department. This ROW is undeveloped with no improvements planned. This land cannot be expected to detain the difference in flows. The undeveloped right-of-way will discharge a total of 63.09 cfs. This leaves 300.70 cfs for the developable portion of the basins to discharge. There is a total of 146.94 developable acres in the three basins. This will be an allowable discharge of 2.05 cfs/acre, not including the ROW which will discharge the existing undeveloped flow rate. The allowable discharge rate includes street flow from streets within and adjacent to each parcel.

This offsite flow must be routed around the site in a storm sewer system located within the public streets. A 48" RCP storm sewer in Bluewater west of 94th Street will collect the offsite flows from the north, which includes Basins 10D, 11D, and 12D-2 and the ROW areas. This is a total developed flow of 152.49 cfs. The storm drain in Bluewater will connect to a proposed 48" RCP storm sewer in 94th Street. The storm drain in 94th Street will connect to a 54" storm drain Avalon. This system will convey the developed flows from the RV Park, Basin 12D-6 and Basin 12D-1, located south of Bluewater Road and north of Avalon Road, and also the incoming flows from the Bluewater storm drain. The Avalon storm sewer will convey a total

of 219.32 cfs from the developed upland basins and the RV park. The 54" storm drain in Avalon will flow east to 90th Street. A second storm drain located west of 94th Street in Bluewater will convey the 14.66 cfs from Basin 12D-3 via a 24" pipe to 90th Street. At 90th Street the 60" RCP storm drain will flow south until it connects with the proposed 66" storm sewer located at the intersection of 90th Street and Volcano Road.

The storm sewer in Volcano Road will collect the flow from the west of the site. The developed offsite basin 12D-3 has a developed runoff of 52.60 cfs. A 48" RCP storm drain in Volcano Road will collect the developed flows from Basin 12D-3. This storm drain has been sized for the offsite undeveloped flow rate of 174.18 and will have capacity for the 52.60 of developed future offsite flows.

When the temporary on-site retention pond is removed, the developed flows from the mobile home park will drain to the storm drain in Volcano Road. The 48" RCP storm drain will contain 108.91 cfs at this point. The 60" RCP in north 90th Street will connect to the storm drain in Volcano and a total of 364.31 cfs will continue to drain east in a 66" RCP in Volcano Road to south 90th Street. This storm sewer will connect to the proposed 66" storm sewer in 90th Street and the flows conveyed south to the eventual outfall.

On-Site Drainage Management Plan

The proposed drainage solution is to route the onsite runoff to three temporary retention ponds located onsite. One retention pond (Pond 1) will be located on the future RV park site. The other two ponds (Ponds 2a and 2b) will be located on the proposed mobile home park site. The undeveloped offsite runoff from basins 108 and 112b will be ponded in the mobile home park site in the onsite retention pond (Ponds 2a).

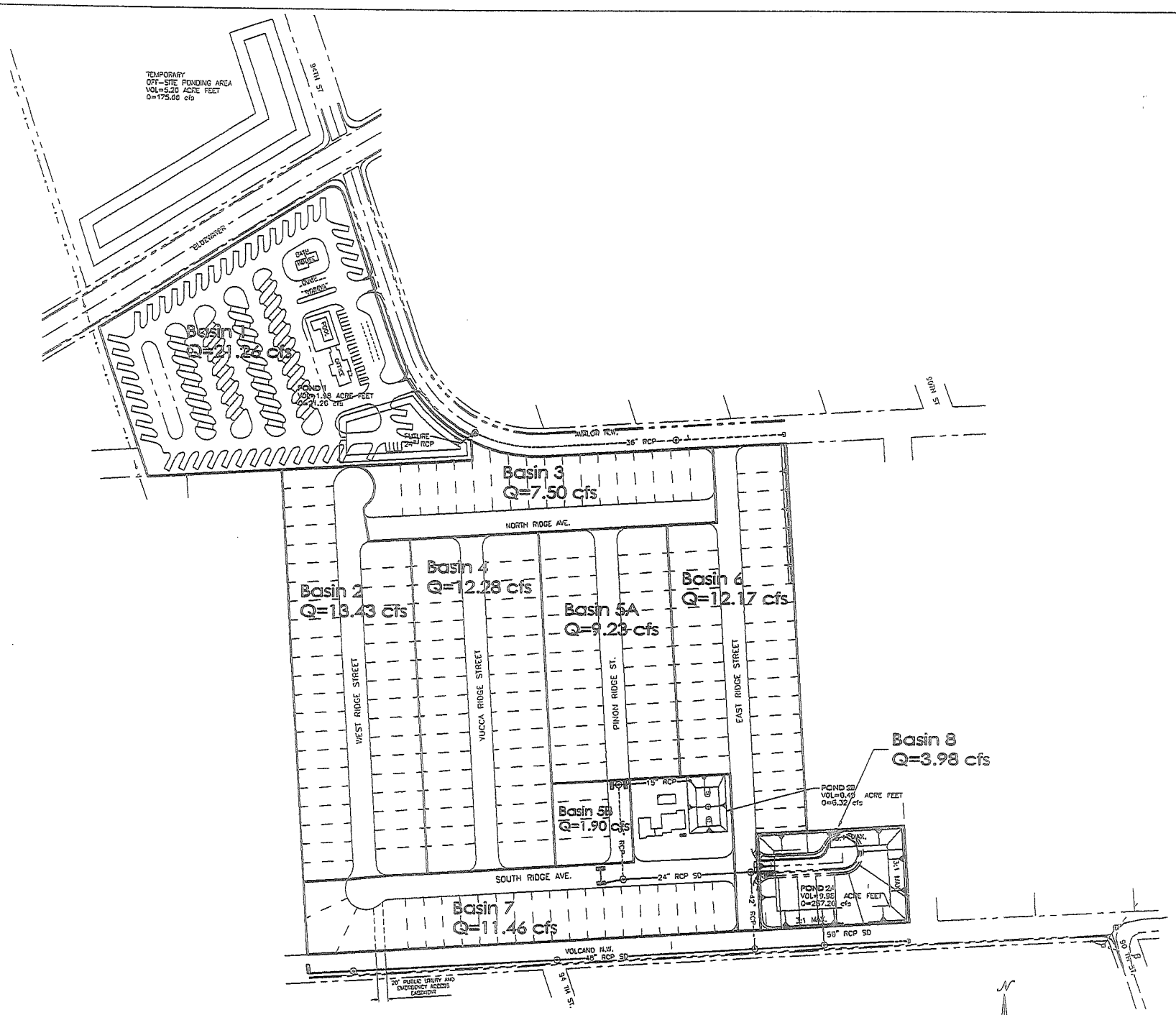
In the future, the developed flows from offsite basins Basin 103, 108, and 109 will be intercepted by Interstate 40 and 98th Street. The offsite developed runoff from basins 112a

and 113a will be included in the developed basin 12D-2 captured in a proposed storm drain in Bluewater Road. The offsite developed runoff from basin 112b will be part of the developed basin 12D-4 and will be conveyed by the proposed 48" storm drain in Volcano Road to a proposed 66" storm drain in 90th Street. At this time the temporary onsite retention ponds (Ponds 2a and 2b) will be removed and a permanent detention pond constructed. The mobile home park will drain to the proposed storm sewer in Volcano Road. The onsite retention pond (Pond 1) in the RV park will also be removed and a permanent detention pond constructed in its place. The RV park will drain to a proposed 60" storm drain in Avalon Road.

The site contains eight on-site proposed basins. The basins, the runoff values and the ponding location are shown in the following table.

Basin	Runoff (cfs)	Location
1	21.26	Pond 1
2	13.43	Pond 2a
3	7.50	Pond 2a
4	12.28	Pond 2a
5a	9.23	Pond 2b
5b	1.90	Pond 2a
6	12.17	Pond 2a
7	11.46	Pond 2a
8	3.98	Pond 2a

Basin 1 consists of the future proposed RV park and will drain to a proposed temporary retention pond (Pond 1) located in the southeast corner of the basin. Basin 1 has 21.26 cfs of developed runoff flow. Pond 1 will have a capacity of 1.9842 ac-ft which is greater than the required capacity of 1.8073 ac-ft. In the event of an emergency, the runoff will overflow from a 20.50 foot wide spillway. When the area is fully developed the retention pond will be removed and a permanent detention pond constructed. The detention pond will drain to a proposed 60" RCP storm drain in Avalon Road. The storm drain in Avalon Road has been designed to carry



Developed Basin Layout

the developed controlled flows from the RV park, the developed flows from the upstream basin 12D-1 and 12D-6 and the incoming flows from the Bluewater storm sewer.

The on-site basins 2 thru 8 consist of the mobile home park and will drain to the two proposed retention ponds (Pond 2a and Pond 2b) located in the southeast corner of the mobile home park. A proposed 24" RCP storm drain system in South Ridge Avenue will collect the flows from the site and convey them to retention Pond 2a. An eight foot channel will transport the flows that are not intercepted by the proposed 24" RCP storm drain system into Pond 2a. A total of 65.6 cfs will be retained from the mobile home park in Pond 2a. An 18" RCP pipe with a 13" orifice plate in Pinon Ridge Street will convey 6.32 cfs from Basin 5A into Pond 2b. The remaining flow from Basin 5A will drain to Pond 2a. When the retention ponds are removed the 18" storm drain will connect to the 24" RCP storm drain in South Ridge Street and eventually drain to the proposed 48" RCP in Volcano Road.

Summary

Basin 1 consists of the RV park and a total of 21.26 cfs will be ponded in a proposed on-site retention pond. Basin 2 thru 8 consist of the mobile home park and will be ponded in two proposed on-site retention ponds. When downstream improvements are constructed the retention ponds will be removed and permanent detention ponds constructed.

The offsite flows from the northwest (Basins 103, 109, 112a, and 113a), will be ponded in a temporary retention pond located north of Bluewater Road (Pond 3). When upstream improvements are constructed the offsite flows will be cut off at 98th Street and the retention pond removed. The storm drain in Bluewater will be designed the convey the offsite developed basin east and north of 98th Street.

The offsite flows from the west (Basins 108, and 112b), will be retained in the two proposed retention on-site ponds in the mobile home park (Pond 2a and 2b). When

downstream improvements are constructed the ponds will be removed and a permanent detention pond constructed. The site will discharge to Volcano Road at a controlled rate. The developed flows from the west will be cut off at 98th Street and the developed flows from east of the site will be conveyed via the 48" RCP pipe in Volcano Road. Storm drains in Bluewater and Avalon will convey the flow from the developed basin (Basin 12D) to the proposed 66" storm drain located at 90th Street and Volcano.