

**DRAINAGE REPORT**  
**for**  
**VISTA DEL NORTE, NORTH POND**

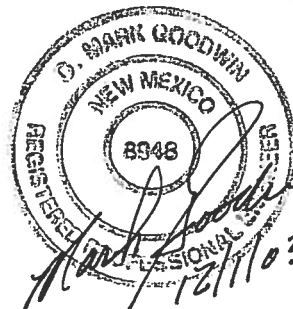
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*D-16/0002*

## **PURPOSE**

*The approved drainage report for Alameda Business Park (Bohannon-Huston, Inc., 2/17/99) identifies a maximum allowable discharge of 4.15 cfs (100-year, 6-hour) from the Vista del Norte North Pond to the Edith Lift Station, located along the east side of Edith Blvd., north of Paseo del Norte (pertinent pages of report are located in Appendix A, and Master Storm Drain Plan is located in Plate 2). The purpose of this submittal is to provide the pertinent hydrologic, and hydraulic calculations to support the construction of the required storm drain infrastructure improvements that will deliver the storm flows from the north pond to the Edith Blvd. lift station.*

## **METHODOLOGY**

*Hydrological conditions were analyzed for the 100-year, 6-hour storm, and 100-year, 24-hour storm (pond capacity) in accordance with the revised Section 22.2, Hydrology, of the Development Process Manual (DPM) for the City of Albuquerque, dated January 1993. All data and calculations supporting this study are located in Appendix B & C of this report.*

## **OVERVIEW OF ANALYSIS**

*A +/- 30 acre-foot temporary retention pond constructed along Los Lomitas Drive has been used to receive the storm flows from various subdivisions within the Vista del Norte Master Planned Community. Plate 1 contains a boundary map identifying drainage basins contributing storm flows to this pond. With the proposed infrastructure improvements, this pond will be converted into a detention pond with an adequately sized outfall structure to regulate outflow (see outfall design calculations in Appendix C). The AHYMO run, located within Appendix B, quantifies the storm flows being routed to the pond, and the associated pond volume requirements.*

*Since there is no public right-of-way available adjacent to the North Pond, an emergency overflow spillway was not a viable option to consider on the future detention pond. An alternative solution is to provide a 24" riser pipe with appropriately sized orifice holes to regulate outflow from the pond, and a grated 24" opening, set at the maximum water surface elevation, in case of an emergency.*

*In reviewing this report, one will note that the design outflow from the pond is at 4.00 cfs instead of the 4.15 cfs identified above. This is to allow for a combined regulated discharge of 0.15 cfs from Tracts U3, U4, and U5 (see Appendix C) which cannot surface drain to the pond itself. Instead, flows from these tracts will connect to the pond outfall storm drain system, downstream of the pond outfall.*

## **CONCLUSION**

*With the ongoing development of the Vista del Norte master planned community, the construction of the proposed infrastructure, along with the supporting hydrologic & hydraulic analysis contained in this report, will satisfy the recommendations of the previously approved Master drainage studies.*

The site, as described in the 'Site Location and Characteristics' section below, is approximately 66.13 acres. A hydrologic computer program (AHYMO) and Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres were used.

### **III. SUMMARY OF THE RELATED PLATTING AND EASEMENTS**

There is currently a slope easement located along the western boundary of the Alameda Business Park boundary. It is our desire to vacate this existing slope easement along the western boundary because it is no longer necessary. The enclosed grading plan proposes to slope up from Edith Boulevard at a 3:1 in order to tie to the proposed grades along the western boundary. The grade differential could have been accomplished by the slope proposed or by the construction of a series of retaining walls. Each lot within the proposed Alameda Business Park Development is required to submit a package to EPC which includes a grading and drainage plan. The development of those lots adjacent to Edith Boulevard may construct a series of retaining walls in order to take advantage of more developable area. Subsequently, the slope easement is not a necessity for the construction of public infrastructure. Therefore a request has been made for its vacation.

Tract A will contain the interim retention pond and permanent detention pond and pump station. This tract will be given to the City of Albuquerque so as to maintain and operate the pond and future pump station. The pump station will discharge storm water to the existing AMAFCA North Diversion Channel within the public right of way within the Alameda Business Park and the necessary public storm drain easements. The future Alameda Business Park Pump Station will receive storm water flow from the Vista Del Norte Pond via a 24" RCP located within the public rights of way of El Pueblo Road and Edith Boulevard.

sump in the road. Storm water will then be direct from inlet into a storm drain under Edith, which will be directed to the detention pond within Tract A.

**Basin 32 (0.88 acres,  $Q_{100}=1.69$  cfs)** is the remaining portion of tieback sloped areas along the western boundary of the Alameda Business Park. Basin 32 drains to **Basin 23 (1.05 acres,  $Q_{100}=4.55$  cfs)** within Edith Boulevard. The combined flow ( $Q_{100}=6.24$  cfs) from Basins 32 and 23 will drain to a low point within Basin 23 until the development of the future four-lane roadway. After the development of the future four-lane roadway, a portion of the runoff from these basins will be captured by two single grate Type "A" inlets in Edith Boulevard at the south end of the site (two inlets on each side of the roadway). The runoff caught in the inlets will then be directed into the Edith Storm Drain that was built between the Vista Del Norte and Alameda Business Park Ponds.

**Basin 7 (3.08 acres,  $Q_{100}=13.36$  cfs)** is the area of Tract A that contains the temporary retention pond as a part of Phase 1. The temporary retention pond volume (100 year 24 hour storm event) required for the fully developed condition of the Alameda Business Park along with the future development of Edith Boulevard is **12.15 acre-feet**.

Basin 7 (Tract A) will also contain the future pump station and detention pond as a part of Phase 2. The next section below describes in more detail the relationship between the pump station and the permanent detention ponds in Vista Del Norte and the Alameda Business Park.

## **VII. PHASE 2 DEVELOPED HYDROLOGICAL AND HYDRAULIC CONDITIONS (CONTRIBUTION FROM VISTA DEL NORTE)**

For additional assistance throughout this section, please refer to the Edith Boulevard Storm Drain Plan and Profile Sheet and the Vista Del Norte Drainage Plan and Interim Grading Plan enclosed within the Exhibit section of this report.

The North Basin on the Vista Del Norte Drainage Plan will drain storm water runoff to its North Detention Pond. As shown on the Vista Del Norte Drainage Plan, the volume required for the proposed detention pond on the **Vista Del Norte Drainage Plan** is 21.92 acre-feet. Our analysis has determined that the runoff volume required is **20.94 acre-feet**.

In order to drain the site within a 96 hour period a controlled flow rate of 4.15 cfs will discharge from the Vista Del Norte Pond into a 24" RCP storm drain directed toward the Alameda Business Park Pond. The public storm drain will be located within the El Pueblo Road right of way from the Vista Del Norte Pond to Edith Boulevard. The storm drain will continue up Edith Boulevard until it discharges into the Alameda Business Park Pond. The public storm drain within Edith Boulevard will pick up a small amount of storm water captured by a couple of future inlets within the future development of Edith.

The only inlets contributing to the storm drain between the Alameda Business Park and Vista Del Norte ponds is that portion of Edith Boulevard along the southwestern area of the Alameda Business Park. The remaining portion of Edith Boulevard along the Alameda Business Park Site will be serviced by a separate public storm drain system discharging into the Alameda Business Park Pond.

As mentioned above, Edith Boulevard is currently a two-lane roadway with no curb and gutter and contains two low points along the Alameda Business Parks western boundary. This report has analyzed the future development of Edith Boulevard based upon a four-lane divided roadway with a continuous southward slope from the southern high point. The future development of Edith will have a 2% crown in the road and will require two single Type "A" inlets on the east side and one on the west side (with wings on both sides) be constructed at the first low point mentioned above. Also, a Type "A" double inlet and a Type "A" single inlet at the south end of the site will be located on the east and west sides of the road, respectively. A single Type "A" double grate double wing inlet will accept approximately 50 cfs.

The storm water runoff from Edith Boulevard and the Vista Del Norte enter the Alameda Business Park Pond and are combined with the flow from our site. The combined runoff from the **Alameda Business Park Pond** is then discharged at a controlled rate of 6.75 cfs into the **Pump Stations wet well**. A volume of 9.55 acre-feet and controlled discharge of 6.75 cfs are needed to drain the Alameda Business Park Pond within the required 96-hour period. The pump station, located adjacent to the Alameda Business Park Pond, will pump the controlled discharge from the

# VISTA DEL NORTE

## To North Pond

TABLE 1B: SUMMARY OF HYDROLOGY

SUBBASIN ID	AREA (acres)	# Lots	N value	Land Treat. D	Land Treat.B/C	Q(100) cfs	Runoff Volume (Ac.Ft.)
TRACT D Units 4A,4B,5A,5B							
D1	4.18410	22	5.3	51	24.5	15.24	0.578
D2	4.51190	26	5.8	55	22.5	16.78	0.645
D3	1.84279	8	4.3	45	27.5	6.50	0.241
D4	2.48945	11	4.4	45	27.5	8.78	0.326
D5	4.48173	24	5.4	52	24.0	16.41	0.624
D6	4.69405	26	5.5	53	23.5	17.27	0.659
D7	5.74969	33	5.7	55	22.5	21.38	0.822
D8	1.26515	5	4.0	42	29.0	4.40	0.161
D9	7.23163	37	5.1	50	25.0	26.18	0.990
D10	2.12068	10	4.7	47	26.5	7.56	0.283
D11	2.94873	15	5.1	50	25.0	10.68	0.404
D12	2.07038	10	4.8	48	26.0	7.43	0.278
D13	3.10615	16	5.2	51	24.5	11.31	0.429
D14	2.68927	12	4.5	45	27.5	9.48	0.352
D15	1.35818	5	3.7	40	30.0	4.67	0.169
D16	1.39937	8	5.7	55	22.5	5.21	0.200
V3	2.14105	0		80	20.0	9.19	0.377
E2.1	4.45707	17	3.8	41	29.5	15.36	0.561
V2	1.68459	0		80	20.0	7.24	0.297
V1	3.25785	0		78	22.0	13.88	0.567
E1.2	9.60630	45	4.7	47	26.5	34.02	1.273
E2.3	9.55345	43	4.5	46	27.0	37.33	1.392
Bernardo Trails BT1	4.46080	26		60	40/0	16.27	0.641
Bernardo Trails BT2	6.65600	44		60	40/0	24.27	0.956
Bernardo Trails BT3	13.68320	92		60	40/0	49.87	1.966
AMAFCA slope BT4A	1.16992			0	0/100	3.59	0.108
AMAFCA slope BT5A	3.57760			0	0/100	10.98	0.329
AMAFCA slope BT6A	2.09380			0	0/100	6.42	0.193
TRACT N	5.05000			90	10.0	22.01	0.929
TRACT T-1	9.96480	74	7.4	60	40/0	36.32	1.432
TRACT T-1A	1.51400			0	0/100	4.65	0.139

TRACT U-1	3.43270			0	0/100	10.53	0.316
TRACT U-2	3.92930			90	10.0	17.13	0.723
TRACT U-6	23.44330			90	10.0	102.00	4.312
LL	4.73000			80	0/20.4	19.45	0.804
TRACT T-4-A	23.38000			90	10.0	101.84	4.300
<b>SUB TOTAL</b>	<b>189.92898</b>	<b>609</b>				<b>732.37</b>	<b>28.820</b>
TRACT U-3	2.15080			90	10.0	9.38	0.396
TRACT U-4	0.49860			90	10.0	2.19	0.092
TRACT U-5	2.93510			90	10.0	12.80	0.540
<b>SUB TOTAL</b>	<b>5.58450</b>					<b>24.37</b>	<b>1.028</b>
<b>TOTAL</b>	<b>195.51348</b>					<b>756.74</b>	<b>29.848</b>

9-15-03 f \ Vista del Norte Tr E (P.Estrella) \ hydr\_t1b\_rev.wpd



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PROJECT \_\_\_\_\_

SUBJECT \_\_\_\_\_

BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED \_\_\_\_\_ DATE \_\_\_\_\_

SHEET \_\_\_\_\_ OF \_\_\_\_\_

## NORTH PDND VOLUME SUMMARY

ELEV.	AREA (SF)	VDL (AC-FT)	ΣVDL (AC-FT)	Q <sub>out</sub> (cfs)
5006	76,511	0	0	0
5008	84,297	3.69	3.69	0.30
5010	92,083	4.05	7.74	1.01
5012	99,870	4.41	12.15	1.95
5014	107,656	4.76	16.91	3.05
5016	115,443	5.12	22.03	3.72
5017	119,506	5.30	27.33	4.01

\* Max WSElev = 5016.90

Q<sub>out</sub> @ 5016.90 = 3.97 cfs,

\* The top of the existing pond  
embankment is at 5020.

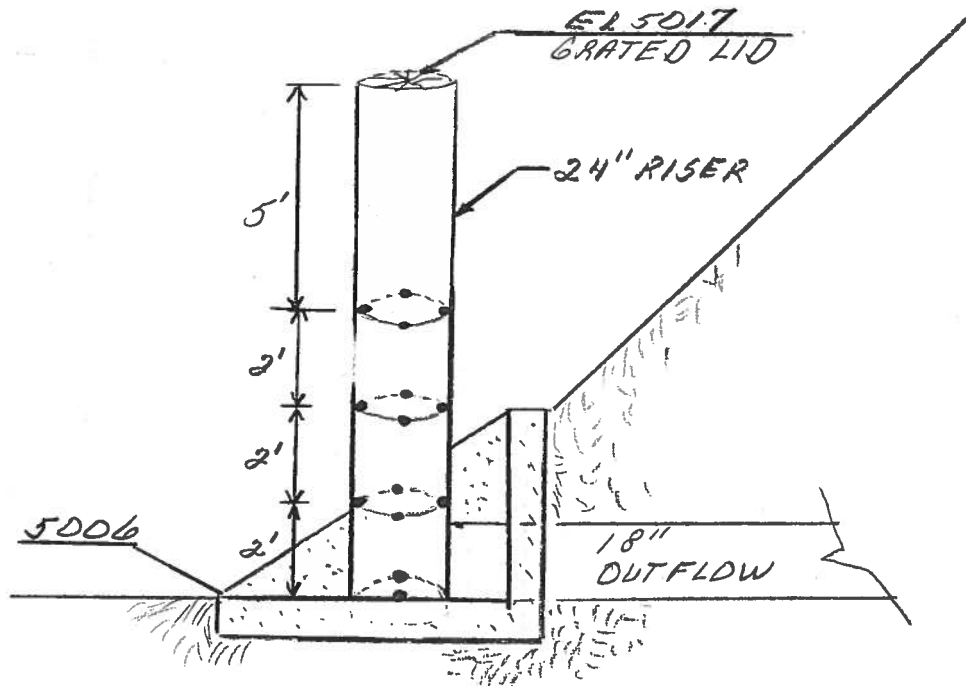




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SHEET \_\_\_\_\_ OF \_\_\_\_\_



At Max. W.S. Elev = 5017:

<u>Driftee El</u>	<u>Q<sub>out</sub> (cfs)</u>
5006 (2 holes)	0.70
5008 (4 holes)	1.26
5010 (4 holes)	1.11
5012 (4 holes)	0.94
	<u>4.01 cfs</u>



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PROJECT VON  
SUBJECT Downstream tracts  
BY JSD DATE 11-18-03  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_  
SHEET \_\_\_\_\_ OF \_\_\_\_\_

Tracts 4-3, 4-4 & 4-5 are downstream of pond, and as such, will not gravity flow to pond.

- Combined Runoff = 24.37 cfs
- Combined Runoff Vol. = 1.028 ac.-ft.
- On site detention w/ combined release rate of .15 cfs to outfall storm drain.

Using a weighted ave.:

4-3 @ 2.15 acres  $\rightarrow$   $Q_{out} = .06$  cfs

4-4 @ 0.50 acres  $\rightarrow$   $Q_{out} = .01$  cfs

4-5 @ 2.94 acres  $\rightarrow$   $Q_{out} = .08$  cfs