

# REGIONAL FLOOD CONTROL DISTRICT



Gale Wm. Fraser, II, P.E.  
General Manager/Chief  
Engineer

February 8, 2007

## BOARD OF DIRECTORS

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Mary M. Wheeler  
City of Las Vegas Planning and Development  
731 S. 4<sup>th</sup> Street  
Las Vegas, NV 89101

Dear Ms. Wheeler:

On February 8, 2007 the Regional Flood Control District Board of Directors held a public hearing and unanimously adopted a Master Plan Amendment for the Racel Street Collector Planning Area. The Master Plan Amendment was performed in accordance with NRS 543.597.

NRS 543.597, subsection 6, states in part, if a proposed amendment to the master plan is adopted unanimously by the board, and by the governing body of the local government in whose jurisdiction will be located the structures necessary to carry out the purposes of the amendment, after a public hearing by each, the amendment becomes effective and no other hearing or approval is required by any other board or commission, including those responsible for decisions relating to planning or zoning.

A copy of the District agenda item, including the related backup material is enclosed with this letter for your use in holding a public hearing to consider adoption of this amendment.

If I can be of further assistance in this matter, please contact me at 455-3139.

Sincerely,

Gale Wm. Fraser, II, P. E.  
General Manager/Chief Engineer

Enclosure

Cc w/enc.: Randy Fultz, CLV, Assistant City Engineer  
Jorge Cervantes, City Engineer  
Greg McDermott, CLV, Engineering Project Manager  
Robert Welch, Engineering Project Manager  
Barbara Jo Ronemus, City Clerk

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**CLARK COUNTY  
REGIONAL FLOOD CONTROL DISTRICT**

**AGENDA ITEM**

**SUBJECT:**

**MASTER PLAN AMENDMENT FOR THE RACEL STREET COLLECTOR PLANNING  
AREA**

***THIS IS A PUBLIC HEARING***

**RECOMMENDATION SUMMARY**

**STAFF:** Approve and recommend that the Board find the Master Plan Amendment sets for the most effective structural and regulatory means for correcting existing problems of flooding in the area and dealing with the probable effects of future development (NRS 543.590[3]). Also subject to approval from the City of Las Vegas City Council.

**TECHNICAL ADVISORY:** Follow staff recommendation.

**CITIZENS ADVISORY:** Follow staff recommendation.

**RFCD AGENDA  
ITEM #23  
DATE: 02/08/07**

CLARK COUNTY  
REGIONAL FLOOD CONTROL DISTRICT  
AGENDA ITEM

<b>SUBJECT:</b> MASTER PLAN AMENDMENT FOR THE RACEL STREET COLLECTOR PLANNING AREA
<b>PETITIONER:</b> CITY OF LAS VEGAS
<b>RECOMMENDATION OF PETITIONER:</b> IT IS RECOMMENDED THAT THE CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT APPROVE THE MASTER PLAN AMENDMENT FOR THE RACEL STREET COLLECTOR PLANNING AREA.

**FISCAL IMPACT:** None by this action

**BACKGROUND:**

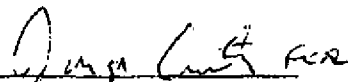
This Amendment proposes revisions to the Racel Street Collector facility and incorporates associated conveyance facilities in the Clark County Regional Flood Control District (CCRFCD) 2002 Master Plan Update (MPU). Facilities in the 2002 MPU identified as RACO 0000 and BRDB 0032 are proposed to be revised. New regional drainage facilities are proposed for the following areas:

- Expansion of the Brent Detention Basin
- Extend and enlarge facility in Racel (RACO 0000) from the Brent Detention Basin west to Durango Drive
- Add facility in Racel (RACO 0064) from Durango Drive to El Capitan Way that includes a lateral facility extending north in El Capitan Way.

The primary purpose of this project is to reduce a regional flooding problem in the area along the Racel alignment. The proposed facilities provide a more cost effective and constructible project while adding protection to the established neighborhoods along the Racel alignment and to provide downstream protection to City and County residents to the east.

The Amended facilities are providing protection to both City and County residents to east of the proposed collection system. The proposed MPA facilities will allow for a decrease in the size of the future downstream Master Planned facilities. This is based upon a reduction in the overall flow due to the increased flow to the expanded detention basin. These facilities will provide immediate relief along the Racel alignment prior to the construction of downstream collection systems identified within the second half of the 10-Year plan.

Respectfully submitted,

  
 Charles Kajkowski, Director  
 Department of Public Works

TAC AGENDA ITEM # 23 Date: 01/25/07	RFCD AGENDA ITEM # 23 Date: 02/08/07
CAC AGENDA ITEM # 23 Date: 01/29/07	

Regional Flood Control District  
AGENDA ITEM DEVELOPMENT

<b>Staff Discussion:</b>	Date: 01/16/07
<b>MASTER PLAN AMENDMENT RACEL STREET COLLECTOR PLANNING AREA</b>	
<p>This Amendment proposes revisions to the Racel Street Collector facility and incorporates associated conveyance facilities in the Clark County Regional Flood Control District (CCRFCD) 2002 Master Plan Update (MPU). Facilities in the 2002 MPU identified as RACO 0000 and BRDB 0032 are proposed to be revised. New regional drainage facilities are proposed for the following areas:</p>	
<ul style="list-style-type: none"><li>• Expansion of the Brent Detention Basin</li><li>• Extend and enlarge facility in Racel (RACO 0000) from the Brent Detention Basin west to Durango Drive</li><li>• Add facility in Racel (RACO 0064) from Durango Drive to El Capitan Way.</li></ul>	
<p>The primary purpose of this project is to reduce a regional flooding problem in the area along the Racel alignment. The proposed facilities provide a more cost effective and constructible project while adding protection to the established neighborhoods along the Racel alignment and to provide downstream protection to City and County residents to the east.</p>	
<p>The Amended facilities are approximately \$1.7 million more (8%) than the 2002 MPU Facilities in 2002 dollars but provide a better solution for the area.</p>	
<b>Staff Recommendation:</b>	
<p>Approve and recommend that the Board find the Master Plan Amendment sets forth the most effective structural and regulatory means for correcting existing problems of flooding in the area and dealing with the probable effects of future development (NRS 543.590[3]). Also, subject to approval from City of Las Vegas City Council.</p>	
<b>Discussion by Technical Advisory Committee:</b>	AGENDA #23 Date: 01/25/07
<b>Recommendation:</b>	
<p>Follow staff recommendation.</p>	
<b>Discussion by Citizens Advisory Committee:</b>	AGENDA #23 Date: 01/29/07
<b>Recommendation:</b>	
<p>Follow staff recommendation.</p>	

## **1. INTRODUCTION**

This Master Plan Amendment (MPA) was prepared by the Louis Berger Group, Inc. for the City of Las Vegas for the purpose of amending the Clark County Regional Flood Control District 2002 Master Plan Update (MPU) to add a new storm drain along Racel Street between El Capitan Way and Cimarron Road. The storm drain is an extension and modification of a proposed MPU facility referred to as the Racel Street Collector. The storm drain is located in the Northern Las Vegas Wash Watershed planning area and discharges into the proposed Brent Lane Detention Basin.

The 2002 MPU for the subject area was previously amended in 2005 as part of the preliminary design for the Las Vegas Wash Middle Branch (MPA, 2005). Therefore, the information in the 2005 MPA represents the most current information and was used as a base for comparison of the facilities proposed in this study. Figure F-4 shows the currently "effective" master planned facilities as presented in the 2005 MPA.

The proposed Racel Street Collector will intercept more than 550 cfs, during the 100-year storm, which is currently conveyed as surface flow within the streets. The storm drain flow will discharge directly into the nearby Brent Lane Detention Basin, a regional flood control facility (BRDB 0032) currently under design and proposed to be under construction within the next year. In the current MPU, the 550 cfs would not be collected until it reaches Grand Teton Drive, approximate ¾-miles downstream of the proposed storm drain. The Grand Teton Drive storm drain (LVMD 2632 through LVMD 2763) is not proposed to be constructed within the next ten years. Therefore, if this amendment is adopted, the public will receive the benefits of the proposed storm drain more than ten years sooner than under the current MPU.

## **2.0 REVISIONS TO MPU FACILITIES**

Figure F-4A shows the facilities recommended by this MPA (in yellow). Tables 1 and 2 outline the facilities in the 2002 MPU (Amended 2005) that are affected by this amendment and newly recommended facilities, respectively.

Table 1. 2005 MPA Facilities Affected by Amendment

ID / River Mile	Status	Facility Description	Length (ft)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sqmi)	Channel Slope (%)
<b>LVMD</b>		<b>LAS VEGAS WASH - MIDDLE</b>						
2525	P1	22' X 6' RCB	1320	2373	CNW159	WEST3A	5.20	0.40
2550	P1	22' X 6' RCB	1320	2104	CD161-C	WEST3A	3.79	0.40
2574	P1	22' X 6' RCB	1320	2104	CD161-C	WEST3A	3.79	0.60
2599	P1	Conc Chnl 30"W 5'D 2:1 SS	1700	2027	CNW162-C	WEST3A	3.46	0.40
2632	P1	14' X 5' RCBC	1400	1095	CNW139-C	WEST3A	1.24	0.59
2661	P1	12' X 5' RCBC	2640	1095	CNW139-C	WEST3A	1.24	1.00
2711	P1	9' X 5' RCBC	1320	1095	CNW139-C	WEST3A	1.24	1.80
2737	P1	9' X 5' RCBC	1320	1095	CNW139-C	WEST3A	1.24	1.81
2763	P1	72" RCP	2640	525	CNW109-C	WEST3A	0.51	2.40
<b>BRDB</b>		<b>BRENT DETENTION BASIN</b>						
0032	P1	150-ac-ft Brent Lane Detention Basin	N/A	1768	CBRENTDB	WEST3A	2.31	N/A
<b>RACO</b>		<b>RACEL STREET COLLECTOR</b>						
0000	P1	60" RCP	710	162	NW142N	WEST3A	0.16	0.70

Table 2. Recommended Facilities

ID / River Mile	Status	Facility Description	Length (ft)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sqmi)	Channel Slope (%)
<b>LVMD</b>		<b>LAS VEGAS WASH - MIDDLE</b>						
2525	P1	21' x 6' RCB	1320	2223	CNW159	WEST3A	5.04	0.40
2550	P1	21' x 6' RCB	1320	1923	CD161-C	WEST3A	3.64	0.40
2574	P1	21' x 6' RCB	1320	1923	CD161-C	WEST3A	3.64	0.60
2599	P1	Conc Chnl 30'W 5'D 2:1 SS	1700	1840	CNW162-C	WEST3A	3.31	0.40
2632	P1	13' X 5' RCBC	1400	928	CNW138-C	WEST3A	1.09	0.59
2661	P1	11' X 5' RCBC	2640	928	CNW138-C	WEST3A	1.09	1.00
2711	P1	8' X 5' RCBC	1320	928	CNW138-C	WEST3A	1.09	1.80
2737	P1	8' X 5' RCBC	1320	928	CNW138-C	WEST3A	1.09	1.81
2763	P1	78" RCP	1320	783	CNW139-C	WEST3A	0.86	2.40
<b>BRDB</b>		<b>BRENT DETENTION BASIN</b>						
0032		165-ac-ft Brent Lane Detention Basin	N/A	1868	CBRENTDB	WEST3B	2.46	N/A
<b>RACO</b>		<b>RACEL STREET COLLECTOR</b>						
0000	P1	72" RCP	2925	557	CNW111S	WEST3B	0.51	2.20
0064	P1	66" RCP	2700	507	NW111N	WEST3B	0.44	2.40

This MPA proposes to:

- 1) enlarge facility RACO 0000 from a 60" RCP to 72" RCP storm drain;
- 2) extend facility RACO 0000 to Durango Drive;
- 3) add a 66" RCP storm drain, RACO 0064, between Durango Drive and El Capitan Way; and,
- 4) enlarge the Brent Lane Detention Basin (BRDB 0032) from 150 acre-ft to 165 acre-ft.
- 5) reduce the size of Las Vegas Wash Middle Branch facilities LVMD 2525, 2550, 2574, 2599, 2632, 2661, 2711, and 2737.
- 6) increase Las Vegas Wash Middle Branch facility LVMD 2763 from a 72" RCP to a 78" RCP and reduce the length.

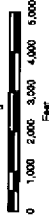
The Racel Street Collector is located within existing street right-of-way, and the Brent Lane Detention Basin is located on State Land that is undergoing a transfer of ownership to the City of Las Vegas. Therefore, additional right-of-way will not be required for the recommended facilities.

**2002  
LAS VEGAS VALLEY  
FLOOD CONTROL  
MASTER PLAN UPDATE  
(AMENDED 2005)**

**LEGEND**

- Ultimate Development Boundary
- Existing Facility
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin

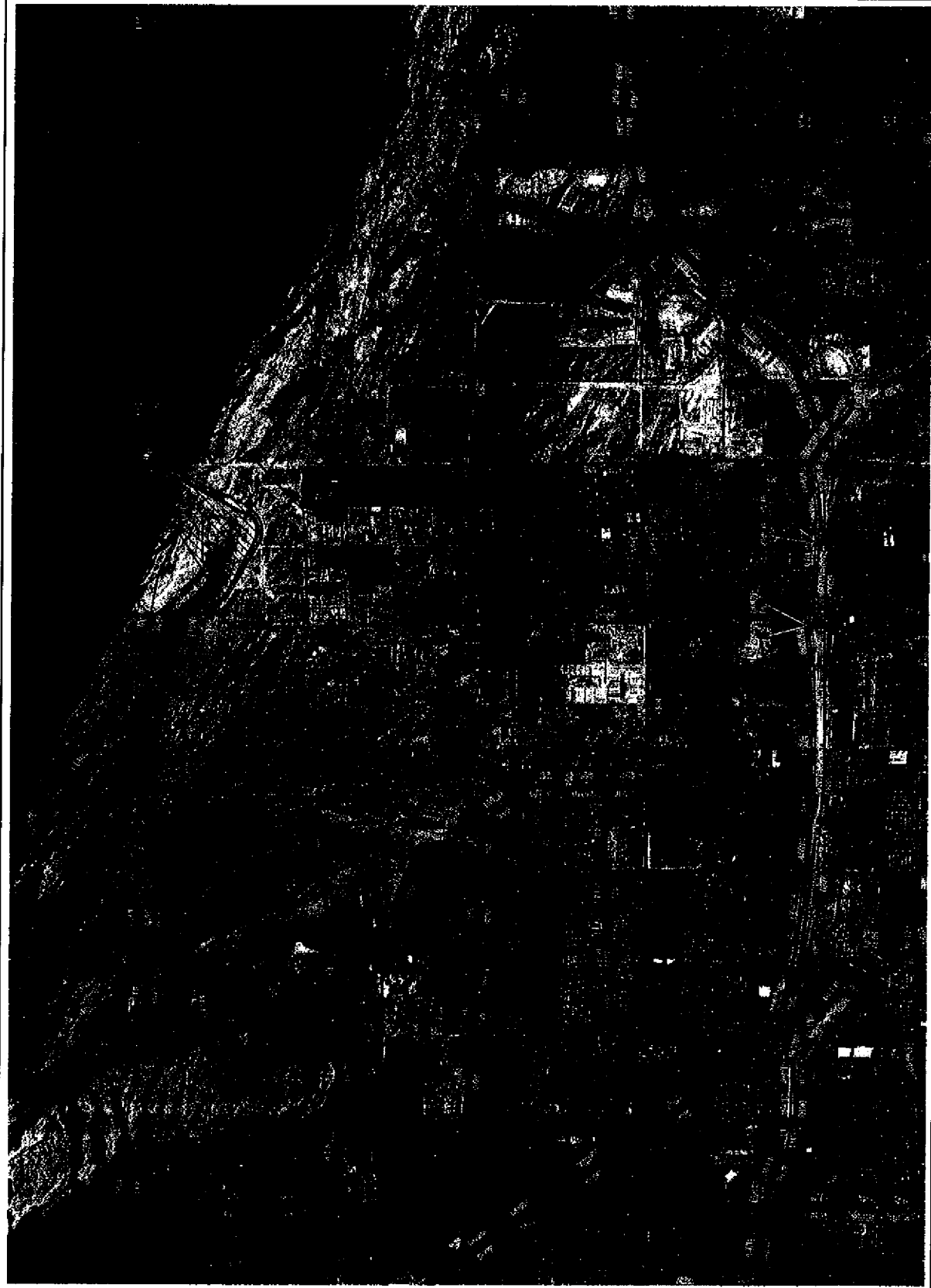
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- XXXX Mile
- Natural Wash
- D-Cells Separator



SCALE: 1 inch = 3000 feet

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30

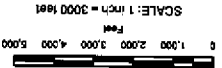
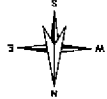
Amended MPU  
Flood Control Facilities  
Figure F-4



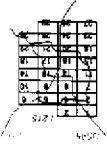
**2002  
LAS VEGAS VALLEY  
FLOOD CONTROL  
MASTER PLAN UPDATE  
(RECOMMENDED)**

**LEGEND**

- Ultimate Development Boundary
- █ Existing Facilities
- █ Category A Proposed Facilities
- █ Category B Proposed Facilities
- █ Local Existing Facilities
- █ Local Proposed Facilities
- █ Amendment Proposed Facilities
- ▨ Detention Basin
- Culvert
- Bridge
- Pipes
- ==== Lined Channel
- ==== Unlined Channel
- XXXXXX Dike
- - - Natural Water
- ID-Map Separator



SCALE: 1 inch = 3000 feet



**FLOOD CONTROL FACILITIES  
FIGURE F-4A**



### 3.0 HYDROLOGIC ANALYSIS AND FACILITY SIZING

The Racel Street Collector will collect and discharge flow into the proposed Brent Lane Detention Basin. The affect will be to reduce the peak flow to the downstream LVMD facilities and increase the storage volume of the Brent Lane Detention Basin.

The 2005 MPA hydrologic model was modified to incorporate the diversion of flow into the Racel Street Collector and Brent Lane Detention Basin. Precipitation values, curve numbers, and lag times for the drainage basins were calculated using the procedures consistent with Section 4.3 of the 2002 MPU Volume 1. Supporting calculations and revised HEC-1 model output are provided in Appendix A.

The 2002 MPU and 2005 MPA facilities were revised based on the results of the hydrologic model using the procedures outlined in Section 4.4 of the 2002 MPU. Supporting facilities sizing calculations are provided in Appendix B. It should be noted that the facility slopes shown in Tables 1 and 2 are average slopes for planning purposes only. The project design will include detailed facility analysis and the actual design slopes may vary.

Figures H-3A and H-4A are a reproduction of the 2005 MPA Hydrologic Maps showing the revisions to the drainage basin boundaries and flow paths made by this amendment. Drainage basin boundaries and flow paths to be revised are marked with an "X" with the new boundaries and flow arrows shown in pink.

It should be noted that the 100-year peak outflow for the Brent Lane Detention Basin is expected to increase, from 12 cfs to approximately 50 cfs, in order to satisfy the CCRFCD criteria requiring that the basin drain time be less than seven days. For the purposes of this MPA, the 100-year peak outflow from the Brent Lane Detention Basin was maintained at 12 cfs as established in the 2005

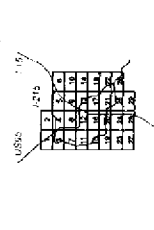
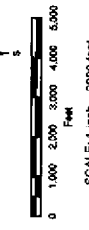
MPA. The anticipated increase was considered negligible and should not affect the size or cost of the downstream conveyance facilities.

The boundaries of basins NW96-C, NW111N, and NW111S were revised to account for the Racel Street Collector. The affects of local facilities along Racel Street, Fort Apache Road, and El Capitan Way (shown in pink and black on Figure F-4A) were included in the hydrologic analysis. It was assumed that the local facility extending north on El Capitan Way, between Racel Street and Guy Avenue, will intercept 100 percent of the 100-year flood. The El Capitan Way facility is an important component of the Racel Street storm drain system and may qualify for regional funding under their policies for lateral collectors.

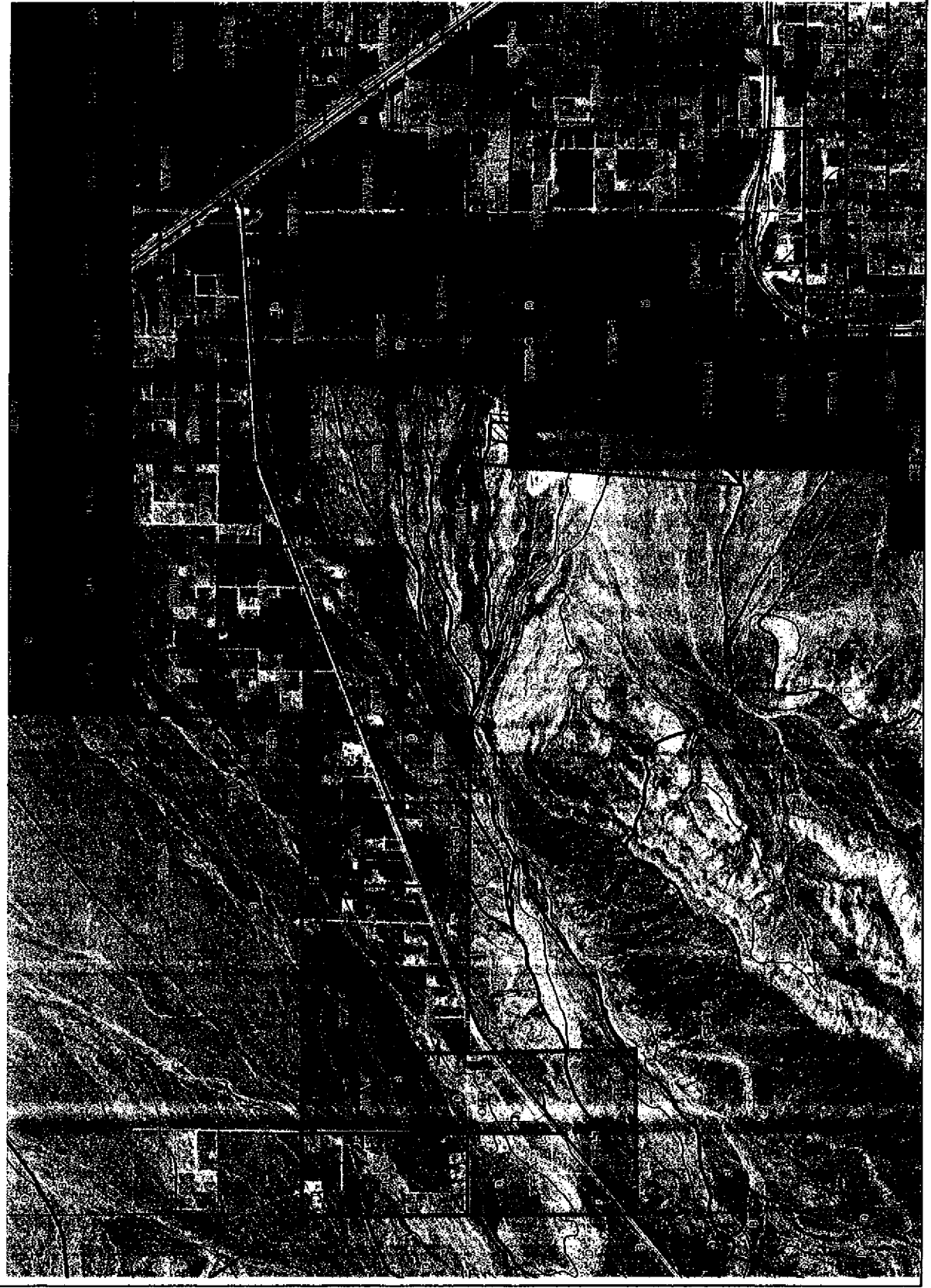
The revised hydrologic analysis resulted in 100-year flow rates of 507 cfs and 557 cfs for facilities RACO 0064 and RACO 0000, respectively. The recommended facility sizes are 66" RCP and 72" RCP, respectively.

**2002  
LAS VEGAS VALLEY  
FLOOD CONTROL  
MASTER PLAN UPDATE  
(RECOMMENDED)**

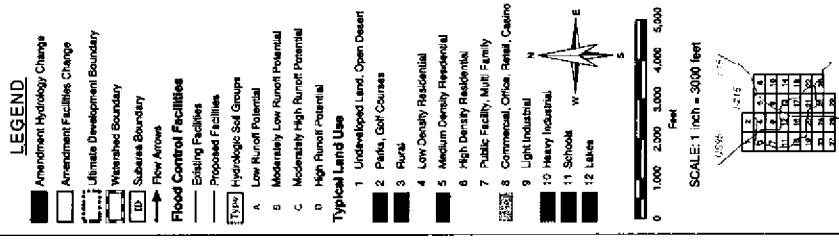
- LEGEND**
- Amendment Hydrology Change
  - Amendment Facilities Change
  - Ultimate Development Boundary
  - Wetland Boundary
  - Subarea Boundary
  - Flow Arrows
- Flood Control Facilities**
- Existing Facilities
  - Proposed Facilities
- Hydrologic Soil Groups**
- A Low Runoff Potential
  - B Moderately Low Runoff Potential
  - C Moderately High Runoff Potential
  - D High Runoff Potential
- Typical Land Use**
- 1 Undeveloped Land, Open Desert
  - 2 Parks, Golf Courses
  - 3 Rural
  - 4 Low Density Residential
  - 5 Medium Density Residential
  - 6 High Density Residential
  - 7 Public Facility, Multi Family
  - 8 Commercial, Office, Retail, Casino
  - 9 Light Industrial
  - 10 Heavy Industrial
  - 11 Schools
  - 12 Lakes



**HYDROLOGIC SUBAREAS  
LAND USE & SOILS  
FIGURE H-3A**



2002  
**LAS VEGAS VALLEY  
 FLOOD CONTROL  
 MASTER PLAN UPDATE  
 (RECOMMENDED)**



**HYDROLOGIC SUBAREAS,  
 LAND USE & SOILS**  
 FIGURE H-4A



#### 4.0 COST ESTIMATES

Construction costs for the amended facilities plan were estimated using the Cost Tool provided with the 2002 MPU. Tables 3 and 4 present the total cost of the affected 2002 MPU facilities and amended facilities, respectively. The total cost of the affected 2002 MPU facilities is \$20.3 million which is \$1.7 million less than the amended facilities plan. The amended plan is approximately 8 percent greater; however, the benefits received by the community by providing flood protection sooner, compounded by the high inflation rate of construction costs, outweigh the additional upfront cost.

**Table 3. Cost Report - Affected 2002 MPU Facilities**

ID / River Mile	E / P	Facility Description	Design and Admin (\$ x 1,000)	Land Acquis. Cost (\$ x 1,000)	Constr Cost (\$ x 1,000)	Total Cost (\$ x 1,000)
<b>LVMD</b>		<b>LAS VEGAS WASH – MIDDLE</b>				
2525	P1	22' X 6' RCB	\$339	\$0	\$2,231	\$2,570
2550	P1	22' X 6' RCB	\$339	\$0	\$2,231	\$2,570
2574	P1	22' X 6' RCB	\$339	\$0	\$2,231	\$2,570
2599	P1	Conc Chnl 30'W 5'D 2:1 SS	\$161	\$160	\$1,057	\$1,378
2632	P1	14' X 5' RCBC	\$263	\$0	\$1,727	\$1,990
2661	P1	12' X 5' RCBC	\$459	\$0	\$3,018	\$3,477
2711	P1	9' X 5' RCBC	\$199	\$0	\$1,312	\$1,511
2737	P1	9' X 5' RCBC	\$199	\$0	\$1,312	\$1,511
2763	P1	72" RCP	\$213	\$0	\$1,398	\$1,611
		<b>Project Total</b>	<b>\$2,511</b>	<b>\$160</b>	<b>\$16,517</b>	<b>\$19,188</b>
<b>BRDB</b>		<b>BRENT DETENTION BASIN</b>				
0032		150-ac-ft Brent Lane Detention Basin	\$97	\$0	\$607	\$704
		<b>Project Total</b>	<b>\$97</b>	<b>\$0</b>	<b>\$607</b>	<b>\$704</b>
<b>RACO</b>		<b>RACEL STREET COLLECTOR</b>				
0000	P1	60" RCP	\$48	\$0	\$319	\$367
		<b>Project Total:</b>	<b>\$48</b>	<b>\$0</b>	<b>\$319</b>	<b>\$367</b>
		<b>Total</b>	<b>\$2,656</b>	<b>\$160</b>	<b>\$17,443</b>	<b>\$20,259</b>

Table 4. Cost Report – Amended Facilities

ID / River Mile	E / P	Facility Description	Design and Admin (\$ x 1,000)	Land Acquls. Cost (\$ x 1,000)	Constr Cost (\$ x 1,000)	Total Cost (\$ x 1,000)
<b>LVMD</b>		<b>LAS VEGAS WASH – MIDDLE</b>				
2525	P1	21' x 6' RCB	\$331	\$0	\$2,178	\$2,509
2550	P1	21' x 6' RCB	\$331	\$0	\$2,178	\$2,509
2574	P1	21' x 6' RCB	\$331	\$0	\$2,178	\$2,509
2599	P1	Conc Chnl 30'W 5'D 2:1 SS	\$161	\$160	\$1,057	\$1,378
2632	P1	13' X 5' RCBC	\$253	\$0	\$1,666	\$1,919
2661	P1	11' X 5' RCBC	\$440	\$0	\$2,893	\$3,333
2711	P1	8' X 5' RCBC	\$189	\$0	\$1,240	\$1,429
2737	P1	8' X 5' RCBC	\$189	\$0	\$1,240	\$1,429
2763	P1	78" RCP	\$115	\$0	\$758	\$873
		<b>Project Total:</b>	<b>\$2,340</b>	<b>\$160</b>	<b>\$15,388</b>	<b>\$17,888</b>
<b>BRDB</b>		<b>BRENT DETENTION BASIN</b>				
0032		165-ac-ft Brent Lane Detention Basin	\$106	\$0	\$665	\$771
		<b>Project Total:</b>	<b>\$106</b>	<b>\$0</b>	<b>\$665</b>	<b>\$771</b>
<b>RACO</b>		<b>RACEL STREET COLLECTOR</b>				
0000	P1	72" RCP	\$235	\$0	\$1,546	\$1,781
0064	P1	66" RCP	\$200	\$0	\$1,314	\$1,514
		<b>Project Total:</b>	<b>\$435</b>	<b>\$0</b>	<b>\$2,860</b>	<b>\$3295</b>
		<b>Total</b>	<b>\$2,881</b>	<b>\$160</b>	<b>\$18,913</b>	<b>\$21,954</b>

## 5.0 CONCLUSIONS

The proposed MPA will incorporate approximately 5,400 ft of storm drain pipe into the MPU along Racel Street between El Capitan Way and Cimmaron Road. The proposed storm drain will intercept more than 550 cfs and discharge into the nearby Brent Lane Detention Basin. In the current MPU, the 550 cfs would flow within the local streets until it reached the Grand Canyon Drive storm drain approximately 3/4-mile downstream. If this amendment is adopted, the District's

Inter-local contract and Ten Year Construction program could be amended to include the Racel Street Collector in the Brent Lane and Tule Springs Detention Basin project which is proposed to begin construction this year. The storm drain would provide immediate flood protection along Racel Street, where none is currently proposed under the MPU. While the cost of the amended plan is approximately 8 percent more than the current MPU, the benefits received by the community by providing flood protection sooner, compounded by the high inflation rate of construction costs, outweigh the additional upfront cost.

## **6.0 REFERENCES**

1. MPA, 2005. Amendment to the 2002 Master Plan Update for Las Vegas Wash Middle Branch, prepared by: The Louis Berger Group, Inc., for the City of Las Vegas Department of Public Works, January 3, 2005.
2. MPU, 2002. Las Vegas Valley Flood Control Facilities Master Plan Update, prepared by: PBS&J, G.C. Wallace, Inc., and The Louis Berger Group, Inc., for Clark County Regional Flood Control District.
3. NWNSPII, 1999. Northwest Neighborhood Flood Control Master Plan Phase 2, prepared by: PBS&J, for City of Las Vegas Department of Public Works.