# CITY OF ALBUQUERQUE, NEW MEXICO

# **Drainage Impact Fee Study**

Final Report

Prepared by:



Integrated Utilities Group, Inc. 5200 DTC Parkway, Suite 530 Greenwood Village, CO 80111-2720

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#### INTRODUCTION

The City of Albuquerque engaged Integrated Utilities Group, Inc. (IUG) to develop a schedule of impact fees for the city's storm water/drainage system (drainage) to be used in conjunction with impact fees for other City services to implement the Planned Growth Strategy (PGS) for the City. The City's proposed Impact Fee pertains only to City owned and planned drainage infrastructure projects. The City's proposed drainage impact fee is separate from any fees or charges collected by the Albuquerque Metropolitan Area Flood Control Agency (AMAFCA), a separate regional drainage agency which is responsible for certain regional flood and drainage infrastructure assets and operations. However, credit may be given for constructing an AMAFCA project that is also on the City Impact Fee CIP.

The following sections present the legal bases for the City's drainage impact fee, the methodology used to calculate the impact fee, the service areas where the fee will be applied, the data for the study, the analyses conducted by the study, the results, comparisons to current Bernalillo County drainage impact fees, City management costs, an the current impact fee capital improvements program (CIP).

#### **LEGAL BASES**

The City of Albuquerque is authorized to impose development impact fees under The New Mexico Development Fees Act [5-8-1 to 5-8-42 NMSA 1978], which authorizes cities and counties to enact or impose impact fees on land within their respective corporate boundaries and to pay specified costs of constructing capital improvements or facility expansions with impact fees. Section 5-8-3.B "If it complies with the Development Fees Act, a municipality or county may enact or impose impact fees on land within its respective corporate boundaries." Section 5-8-2.I defines impact fee as:

[A] charge or assessment imposed by a municipality or county on new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development. The term includes amortized charges, lump-sum charges, capital recovery fees, contributions in aid of construction, development fees and any other fee that functions as described by this definition. The term does not include hook-up fees, dedication of rights of way or easements or construction or dedication of on-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks or curbs if the dedication or construction is required by a previously adopted valid ordinance or regulation and is necessitated by and attributable to the new development.

The statute authorizes specific services to be funded with impact fees. Section 5.8-2. provides the list:

- D. "capital improvement" means any of the following facilities that have a life expectancy of ten or more years and are owned and operated by or on behalf of a municipality or county:
- (1) water supply, treatment and distribution facilities; wastewater collection and treatment facilities; and storm water, drainage and flood control facilities:
- (2) roadway facilities located within the service area, including roads, bridges, bike and pedestrian trails, bus bays, rights of way, traffic signals, landscaping and any local components of state and federal highways;
- (3) buildings for fire, police and rescue and essential equipment costing ten thousand dollars (\$10,000) or more and having a life expectancy of ten years or more; and
- (4) parks, recreational areas, open space trails and related areas and facilities;

The New Mexico enabling act adopts the proportionate share concept in Section 5-8-7 with "[t]he fee shall not exceed the cost to pay for a proportionate share of the cost of system improvements, based upon service units, needed to serve new development."

In Section 5-8-2.G "Facility expansion" is defined in the statute as the "expansion of the capacity of an existing facility that serves the same function as an otherwise necessary new capital improvement, in order that the existing facility may serve new development." Section 5-8-2.G further specifies that "facility expansion" does not include "the repair, maintenance, modernization or expansion of an existing facility to better serve existing development."

The Act specifies that no impact fees shall be spent to provide new or better facilities for existing development. Furthermore, fees collected for drainage capital improvements and facility expansion can only be spent for drainage capital facilities and facility expansions and not for any other type of improvements or facilities.

A capital improvement plan is required by the Act to be the basis of impact fee programs. Section 5-8-23 requires that "If the governing body adopts an ordinance, order or resolution approving the land use assumptions, the municipality or county shall provide for a capital improvements plan to be developed by qualified professionals using generally accepted engineering and planning practices . . . ."

Therefore, the City of Albuquerque is authorized to adopt drainage impact fees provided that the fees do not exceed a proportionate share of the cost of providing capital improvements to new developments within service areas. Furthermore, those impact fees must be in accord with land use assumptions adopted by the City Council and be incorporated into Impact Fee Capital Improvement Plans. This report will calculate the drainage impact fees consistent with these requirements.

#### **Level of Service**

The level of service for facilities to be included in the drainage impact fee is defined by the 100-year storm event. The facilities in the project listing are for those structures and channels that encompass improvements to the major facilities. Local improvements such as street drainage and lot drainage are not included in this listing. Such local improvements will remain the responsibility of the developer.

#### DRAINAGE IMPACT FEE METHODOLOGY

IUG developed a methodology that met the requirements of both the state statutes and the City PGS. The IUG methodology consisted of the following steps:

- service area definition,
- drainage growth project identification and cost updating,
- obtaining and using land use projections by drainage area based on City Council approved land use assumptions,
- assigning drainage projects to the appropriate (nexus based) drainage service areas,
- evaluating impervious area changes based on the PGS proposed land use changes for 2025 in each service area,
- using Albuquerque's Development Process Manual (DPM) to calculate the service units based on impervious area,
- calculating the drainage impact fees based on this information.

This overall methodology complies with the cost theory that is being implemented in Albuquerque. It identifies the full cost of new drainage facilities to support growth, and it identifies a mechanism for including the net equity from existing facilities, which were previously constructed to serve growth. This method is known locally as the full marginal cost method. It is commonly known as and is consistent with the buy-in method. The buy-in method consists of two portions: a

reimbursement fee (for net equity in excess capacity in existing facilities) and a capital fee to cover the construction of projects specifically needed to support growth. The buy-in method is further analyzed below.

#### **RESULTS**

IUG implemented the methodology in conjunction with the City staff to achieve the following results:

#### Service Area Definitions

The underlying state legislation and the City PGS both require that a rational nexus exist between the impact fee being assigned and the development area or development project that bears the impact fee.

This principle, when applied to drainage leads to a basin-based or basin grouped approach. Thus, developing areas within the same basin or group of basins must pay for the projects that supply the increased drainage capacity required to serve the project or group of projects. IUG worked with City staff to identify basins and basin groups based on the City's previous drainage studies and basins used for National Pollution Discharge Elimination System (NPDES) compliance.

Figure 1 presents the five areas identified for drainage impact fee analysis within the current city limits. Each of the areas is described briefly below.

Northwest Area - This area includes the area in the northwest corner of the current City limits. It extends to the west as far as the Double Eagle Airport. The river is the eastern boundary. The southern boundary of the area is the Ladera Channel and associated upstream diversions just north of Interstate 40. The total size of this area is approximately 15,500 acres.

Southwest Area - The Southwest Area is the remaining part within the current City limits on the west side of the river. The total size of this area is approximately 9,000 acres.

Far Northeast Area – The far northeast service area extends from the northern City limits south to the northern boundary of the fully served area. This size of this area is approximately 11, 700 acres.

Tijeras Arroyo Area – This drainage area drains across the airport and Kirtland Air Force Base. It is a single basin area. The size of this area is approximately 2,600 acres.

Fully Served Area - A large portion of the City (approximately 40,200 acres) is identified as the Fully-served Area and is excluded from the application of impact fees. The fully served area is the area studied by the three main City drainage studies between 1981 and 1987. The existing drainage system in the fully served

area provides drainage to this largely built-up area. However, the systems are dated with numerous hydraulic deficiencies and rehabilitation needs. Therefore, no impact fees were calculated for this area.

#### **Drainage Project Identification and Cost Estimate Updating**

In January 1997, the City, along with Albuquerque Metropolitan Arroyo Flood Control Agency (AMAFCA), prepared a comprehensive list of drainage projects that would be needed for the next 25 years. The projects were identified as those that would correct hydraulic deficiencies; conduct rehabilitation of aging facilities, and to serve growth. This comprehensive listing of projects was taken from the 19 drainage plans that had been done at the time. Two additional recent west side drainage studies that were completed in 1999 and 2000 were added for completeness. See Attachment 1 for a listing of the drainage studies/plans that were used to create this master list. The projects from the studies listed in Attachment 1 were selected and sorted by drainage analysis area. For each project a short description is listed along with the updated capital cost, city grid assignment by zone map and drainage study identification.

AMAFCA's projects are funded separately from City funding sources even though a significant source of the combined funding comes from the development community. There may be cases where projects are jointly funded. When this happens, the City's funds for these joint projects and those others that are used to add capacity are tracked separately and included in the capital project list.

IUG and City staff reviewed the project listings and removed those projects that were either for rehabilitation of existing structures or were to address currently deficient facilities. Following the culling of the ineligible projects, the remaining projects were entered into a GIS database and allocated to the areas shown in Figure 1.

Attachment 2 presents the list of projects that resulted from this analysis. Because of the varying completion dates for the various studies, the cost estimates were updated to June 2004 costs using the Engineering News Record index for major civil construction projects.

#### Reductions, Credits, and Waivers

New Mexico State Law provides for reductions, credits, or waivers from the impact fees for low-income housing. However, IUG established, in discussions with City staff, that there are no designated areas for new construction of low-income housing that would qualify for an impact fee waiver. Therefore, there are no waiver calculations included in the drainage impact fee.

#### **Buy-in Method Analysis**

City drainage project financial records were reviewed for recently (since 2000) completed City drainage projects. IUG limited this review to the last five years' history of projects since data prior to that time were not available. The City has only been classifying drainage capital projects by use (rehabilitation, deficiency correction, growth, and mandate) since 2001. Table 1 shows the total City drainage expenditures for capital projects from the last five years with stated revenue sources.

IUG's review established that the costs of recently completed drainage projects were sufficiently detailed to identify the new capacity portion of the costs separate from the total project cost. However, none of these capital costs could be assigned to the reimbursement portion of the impact fee. The reason for this result is that the City General Obligation (GO) bonds used for the City portion of the project funding were still in the interest payment only portion of the repayment schedule. Therefore, the City has not yet accumulated net equity in the recently completed projects that could be applied to the impact fee.

However, over time, the City will build equity ownership in the drainage facility assets. Thus, the reimbursement component of the impact fee might then increase from the currently computed zero value to a positive number.

IUG recommends that, in the future, the reimbursement portion of the drainage impact fee be expanded to include all drainage fixed assets with remaining excess capacity to serve new growth by drainage service area for possible inclusion of future as-built costs into the Impact Fee Structure. This analysis should be repeated approximately every two years to update the buy-in analysis for city-funded projects that relate to the support of growth. We also recommend that the City consider a revision to its bond repayment practices to accelerate the accumulation of net equity in such drainage projects. The existing net equity data should be compiled by drainage service area and added to the updated growth improvement portion of the drainage impact fee when net equity is earned by the City in the projects.

#### IMPACT FEE CALCULATION

The impact fee calculation is based on previously identified drainage areas and is based on the full marginal cost of new capacity projects. The fee is based on the cumulative costs divided by the total number of expected service units to be developed in the drainage service area. Information was obtained from the Mid-Region Council of Governments related to the existing land use conditions in 2000 and planned citywide 2025 growth. This information was analyzed and reduced to the service areas. Attachment 3 presents the growth-related data by land use type and service area.

#### **Impact Fee Results**

Table 2 presents the drainage impact fees resulting from these analyses. These impact fees are based on actual project analyses and city-adopted land use projections.

#### Comparison to Current Bernalillo County Drainage Impact Fees

Table 3 shows a comparison to the current (June 2004) Bernalillo County fee structure. Overall, the City and the County fees are comparable considering the analysis areas are somewhat different. The County fee is based on a joint 1995 City-County Drainage Impact Fee Study that was not implemented by the City. The current City fee is project-by-project based and represents an accurate estimate for the drainage facilities in the respective drainage service areas.

#### **City Management Costs**

The state statute limits management costs to three (3) percent. City staff, as allowed by state statute, may assign management cost once they are calculated. These costs are not available at this time and are, therefore, not included in the draft drainage impact fee.

#### **Calculation of Drainage Service Units**

Attachment 3 presents the drainage service unit calculations by drainage service area. These calculations present the expected change in impervious area by land use type for the period 2000 to 2025. No baseline land use data exist for 2004. The calculation is based on City Council approved population and housing forecasts. The change in impervious area for each land use type was calculated based on the calculation method used in the DPM. Land use data in square feet of development type were converted to impervious areas in acres using the methods from the DPM. One Service Unit (SU) equals one impervious acre. Single-family housing land use changes were converted to impervious area using a density of five units per acre.

## Impact Fee Capital Improvements Program (IF CIP)

Attachment 4 presents the Drainage Facilities Impact Fee capital Improvements Program (CIP) drainage for the four service areas within the next seven years of the planning cycle (2005 through 2012). This CIP will be updated approximately every two years as the growth patterns change and facility priorities are adjusted.

Figure 1

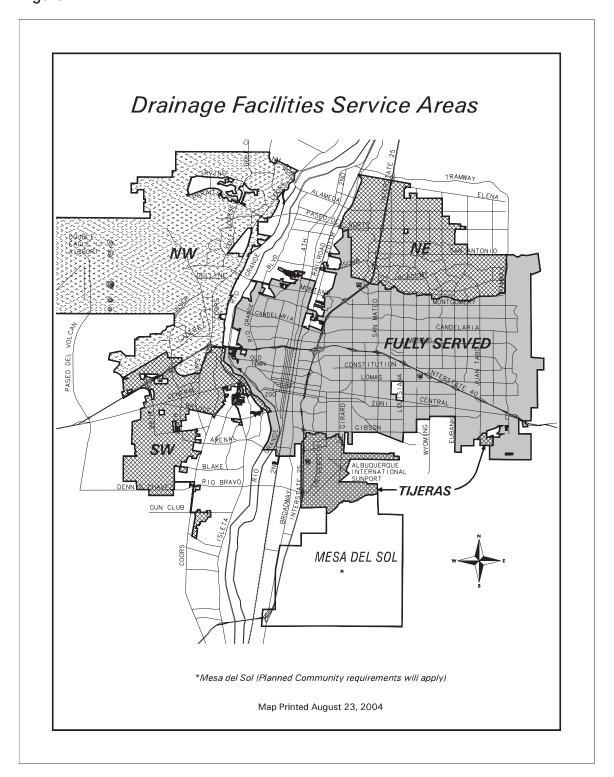


Table 1 Funding for Recent Drainage Projects

COST ELEMENT	2000	2001	2002	2003	2004
City CIP (GO Bond Money)	\$ 5,287,835	\$ 6,572,968	\$ 10,063,018	\$ 6,794,116	\$ 8,000,000
Contributions in aid of Construction (CIAC)	\$21,225,165	\$ 14,944,282	\$ 18,430,982	\$ 24,643,884	\$ 15,138,000
Total Capital Costs	\$ 26,513,000	\$ 21,517,250	\$ 28,494,000	\$ 31,438,000	\$ 23,138,000
City Equity based on Bond Repayment Schedule	\$0	\$0	\$0	\$0	\$0

Table 2 (Revised 11/9/04)

# City of Albuquerque Planned Growth Strategy Implementation Proposed Drainage Impact Fees

SERVICE AREA	CIP PROJECT COSTS, JUNE 2004\$	TOTAL BASIN AREA (AC)	ANTICIPATEDSERVICE UNITS 2000-2025	TOTAL COST PER SERVICE UNIT (\$/SU)
NW	\$ 55,015,528	15,490	3,915	\$ 14,052
SW	\$ 35,393,166	9,021	2,757	\$ 12,836
Fully Served	\$ 0	40,250	2,009	\$ 0
Tijeras	\$ 2,933,604	2,611	221	\$ 13,290
Far NE	\$ 15,044,434	11,753	1,474	\$ 10,208

## Table 3 (Revised 11/9/04)

# City of Albuquerque Planned Growth Strategy Implementation Comparison of Proposed City Drainage Impact Fees to Bernalillo County Impact Fees

SERVICE AREA	PROPOSED CITY FEE	CURRENT (2004) COUNTY FEE	DIFFERENCE
	(\$/SU)	(\$/SU)	
Northwest	\$14,052	\$19,090 or \$13,114	(\$5,038) to \$938
Southwest	\$12,836	\$13,114	(\$278)
Far Northeast	\$10,208	\$13,114	(\$2,906)
Tijeras	\$13,290	No comparable fee	Not Applicable

Attachment 1
City of Albuquerque
Listing of City Drainage Master Plans Used for Information

Albuquerque Master Drainage Study, Volume 1 (North and South Valley Drainage) (1981)

Albuquerque Master Drainage Study, Volume II (1981, Restudy 1987)

Albuquerque Master Drainage Study, Volume III (1987)

Alameda-Riverside Drainage Study (1991)

Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation (1986)

Amole-Hubbell Drainage Management Plan (1999)

Broadway Blvd. Improvements, Final Drainage Report (1999)

Candelaria-Hahn Drainage Analysis-Report (2004)

Double Eagle II Airport Drainage Report (1987)

Far Northeast Heights Drainage Management Plan (1986)

Menaul/Mildred Storm Drainage Improvements (1991)

North Albuquerque Acres Master Drainage Plan (1998)

North Coors Drainage Management Plan (1985)

Northwest Mesa Drainage Management Plan (1989)

Piedras Marcadas Drainage Management Plan (1988)

South Broadway Sector Drainage Management Plan (1990)

South Eubank Area Storm Drainage Plan (1995)

Southwest Valley Storm Drainage Projects Isleta Watershed Study (1991)

Tijeras Arroyo Drainage Management Plan (1987)

West Bluff Drainage Study (1987)

West I-40 Drainage Management Plan (2000)

#### Albuquerque Drainage Impact Fees

#### **AMENDED 11/10/04**

Attachment 2 (Revised 11-9-04)

# **Growth Related Drainage Capital Projects**

Tijeras Arroyo Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
Tijeras Arroyo Drainage Management Plan	Tijeras Arroyo from Four Hills Rd. to the South Diversion Channel: The Tijeras Arroyo Drainage Management Plan offers numerous scenarios for drainage management. Depending upon the development scenario and agreements between City of Albuquerque, AMAFCA, B	\$ 2,933,604	P-16
	Total	\$ 2,933,604	

Far Northeast Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
North Albuquerque Acres Master Drainage Plan	"Construct 54" RCP in Venice extension to Jct with SD-4"	\$ 369,418	B-18
North Albuquerque Acres Master Drainage Plan	Construct 30" RCP in San Pedro from Venice to SD-4	\$ 157,553	B-18
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP in San Pedro from Glendale to La Cueva Channel	\$ 241,517	B-18
	Construct 48" RCP in San Pedro from San Diego to La Cueva Channel		
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP in Florence from Wyoming to Louisiana	\$ 653,846	B-18
	Construct 54" RCP in Louisiana from Florence to San Diego		
	Construct 30" RCP in Louisiana from Beverly Hills to San Diego		
	Construct 60" RCP in San Diego from Louisiana to Jct with SD-1		
	Construct 7		
North Albuquerque Acres Master Drainage Plan	Construct Desilting Basin at Ventura and Glendale	\$ 1,326,531	B-19
	Construct 84" RCP in Glendale from Ventura to Wyoming		
	Construct 96" RCP from Glendale/Wyoming to La Cueva Channel west of Eagle Rock Dike		
	Construct 30" RCP in Mondesto from Wyoming to Jct with 96" RCP		
North Albuquerque Acres Master Drainage Plan	Construct 60" RCP in Ventura from Modesto to Glendale Jct with SD-6	\$ 212,638	B-20
North Albuquerque Acres Master Drainage Plan	Parallel existing 48" with 42" RCP in San Pedro from Signal to Alameda	\$ 425,780	C-18
	Parallel existing 54" with 72" RCP in San Pedro from Alameda to Oakland		
	Parallel existing 54" with 78" RCP in San Pedro from Oakland to Eagle Rock		
	Parallel existing 54" with 60" RCP		
North Albuquerque Acres Master Drainage Plan	Construct 60" RCP relief storm drain in Eagle Rock from San Pedro to I-25 culvert	\$ 125,677.00	C-18

Far Northeast Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
North Albuquerque Acres Master Drainage Plan	Construct 30" RCP storm drain in Alameda from San Pedro connection to SD-9 to Louisiana.  Construct 30" RCP storm drain in Louisiana from Alameda to Signal Avenue.	\$ 93,541	C-18
North Albuquerque Acres Master Drainage Plan	Remove existing 24" RCP in Barstow and replace with 42" RCP from Vinyard Ridge to Green Arbor.	\$ 172,198	C-20
	Remove existing 24" RCP in Barstow and replace with 42" RCP from Green Arbor to Anaheim.		
North Albuquerque Acres Master Drainage Plan	Construct 24" RCP connection from Signal to existing Barstow storm drain.	\$ 34,634	C-20
North Albuquerque Acres Master Drainage Plan	Construct 42" RCP storm drain in Alameda Valley from existing Carrington Subdivision detention pond to Signal Avenue.	\$ 137,886	C-20
	Construct 48" RCP storm drain from Signal Avenue north to proposed La Cueva Channel crossing the property now utilized as an AMAFCA trail		
North Albuquerque Acres Master Drainage Plan	Construct 24" RCP storm drain in Ventura from Alameda to proposed storm drain in Oakland.Construct 54" RCP storm drain in Ventura from Eagle Rock to proposed storm drain in Oakland.	\$ 264,815	C-20
	Construct 48" RCP storm drain in Oakland from Ventura west to the proposed		
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP storm drain in Ventura from 200-feet north of Wilshire south to intersection of Wilshire and Ventura.	\$ 56,360	C-20
	Construct RCP storm drain in entura from Wilshire intersection 225-feet south to existing 36" storm drain.		
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP storm drain in Ventura from Signal Avenue to the proposed La Cueva Channel.	\$ 62,791	C-20

Far Northeast Drainage Area			
Drainage_Report	Proj_Description Proj_Description	Project_Cost2004	Zone_Maps
North Albuquerque Acres Master Drainage Plan	Construct concrete lined channel from I-25 crossing structure to municipal limits west of Louisiana. 10-feet bottom width, depth varies from 5.6-feet at upstream end to 6.1-feet at downstream end.	\$ 2,090,281	B-18
	Construct earth and riprap training dike from channel inl		
North Albuquerque Acres Master Drainage Plan	Construct concrete lined channel from confluence of the main branch of the arroyo and the tributary to the municipal limits at Louisiana, approximately 600-feet southeast.	\$ 472,844	B-18
North Albuquerque Acres Master Drainage Plan	Construct concrete lined channel from existing channel at Barstow to Ventura following an alignment from the existing channel inlet south and east to the Alameda corridor. In the Alameda corridor the channel will follow the Alameda alignment to the munic	\$ 1,144,219	C-20
North Albuquerque Acres Master Drainage Plan	Construct raised county paved road section, off-set to the Glendale R/W, from Holbrook approximately 1100-feet west.  Construct earth and riprap channel north of road section. North sidemaintenance road on top of bank to be used as local access road. 25-f	\$ 513,025	B-20
North Albuquerque Acres Master Drainage Plan	Construct paved dip-section on Venice approximately 1500-feet east of Louisiana.  Construct earth and riprap dike north of dip-section to block off potential flow line to the west.	\$ 153,091	B-19
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP in Florence from Wyoming to Louisiana  Construct 54" RCP in Louisiana from Florence to San Diego  Construct 30" RCP in Louisiana from Beverly Hills to San Diego  Construct 60" RCP in San Diego from Louisiana to Jct with SD-1  Construct 7	\$ 653,846	B-19

Far Northeast Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
North Albuquerque Acres Master Drainage Plan	Parallel existing 48" with 42" RCP in San Pedro from Signal to Alameda	\$ 409,084	C-18
	Parallel existing 54" with 72" RCP in San Pedro from Alameda to Oakland		
	Parallel existing 54" with 78" RCP in San Pedro from Oakland to Eagle Rock		
	Parallel existing 54" with 60" RCP		
North Albuquerque Acres Master Drainage Plan	Construct 60" RCP relief storm drain in Eagle Rock from San Pedro to I-25 culvert	\$ 120,749	C-18
North Albuquerque Acres Master Drainage Plan	Construct 42" RCP storm drain in Eagle Rock connecting to San Pedro storm drain SD-9	\$ 258,482	C-18
	Construct 42" RCP storm drain from Eagle Rock to Modesto in COA Convenience Center drainage easement.		
	Construct 30" RCP storm drain in Eagle Rock from Convenience Cente		
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP storm drain in Oakland approximatley 670-feet east from San Pedro connection to SD-9.	\$ 111,923	C-18
	Construct 24" RCP storm drain in Oakland approximatley 450-feet east from connection to 36" storm drain to intercept street flow.		
North Albuquerque Acres Master Drainage Plan	Construct 30" RCP storm drain in Alameda from San Pedro connection to SD-9 to Louisiana.	\$ 91,669	C-18
	Construct 30" RCP storm drain in Louisiana from Alameda to Signal Avenue.		
North Albuquerque Acres Master Drainage Plan	Remove existing 24" RCP in Barstow and replace with 42" RCP from Vinyard Ridge to Green Arbor.	\$ 165,446	C-20
	Remove existing 24" RCP in Barstow and replace with 42" RCP from Green Arbor to Anaheim.		
North Albuquerque Acres Master Drainage Plan	Construct 24" RCP connection from Signal to existing Barstow storm drain.	\$ 33,277	C-20

Far Northeast Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP storm drain in Ventura from 200-feet north of Wilshire south to intersection of Wilshire and Ventura.  Construct RCP storm drain in entura from Wilshire intersection 225-feet south to existing 36" storm drain.	\$ 54,150	C-20
North Albuquerque Acres Master Drainage Plan	Construct 36" RCP storm drain in Ventura from Signal Avenue to the proposed La Cueva Channel.	\$ 60,328	C-20
North Albuquerque Acres Master Drainage Plan	Construct 30" RCP storm drain from 1050-feet east of Wilshire/Ventura intersection to connect to proposed Ventura storm drain extension (SD-29).	\$ 63,451	C-20
North Albuquerque Acres Master Drainage Plan	Construct 42" RCP storm drain in Holbrook from Signal to Wilshire.  Construct 42" RCP storm drain in Holbrook from Wilshire to Corona.  Construct 78" RCP storm drain in Holrook from Corona to proposed North Domingo Baca Channel (or pipe).	\$ 325,343	C-20
North Albuquerque Acres Master Drainage Plan	Construct concrete lined channel from existing channel at Barstow to Ventura following an alignment from the existing channel inlet south and east to the Alameda corridor. In the Alameda corridor the channel will follow the Alameda alignment to the munic	\$ 1,099,348	C-20
Far Northeast Heights Drainage Management Plan	Construct RCP along Hawkins St. to the North Diversion Channel.	\$ 289,656	D-17
	Service Area Total	\$15,044,434	

Northwest Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	B-8
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	B-9
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	B-10
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	B-11
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	B-12
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,002,874	D-12
Northwest Mesa Drainage Management Plan	Raise levees by 0.57 feet for 25 feet. Backwater analysis recommended first.	\$ 35,429	D-11
Northwest Mesa Drainage Management Plan	Raises levees by 1.1 feet for 6500 feet and increase crossing capacities from mariposa Basin to San Antonio Junction. Backwater analysis recommended first.	\$ 231,062	E-11

Northwest Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	C-10
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 1,966,420	D-11
Double Eagle II Airport Drainage Report	Ladera Playa earthen channel improvements,	\$ 37,110	F-6
Piedras Marcadas Drainage Management Plan	A study of Marcadas Drainage Basin by AMAFCA is complete. The Hydrology staff anticipates that drainage project costs may be as high as \$15,000,000 depending on the nature of improvements and agreements among AMAFCA, the City, National Park Service, and	\$ 963,546	D-12
West Bluff Drainage Study	Construct storm drain on Iliff Rd. from Estancia Dr., E. to Coors Blvd., then N. to the I-40 vee ditch.	\$ 421,775	H-11
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 64,539	J-9
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 864,826	J-10
West Bluff Drainage Study	Construct storm drain from Ladera Dr., Northwest to Dam no. 15 of the Ladera Drainage System.	\$ 580,854	H-10
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 1,161,707	H-10
West Bluff Drainage Study	Construct storm drain on Iliff Rd. from Estancia Dr., E. to Coors Blvd., then N. to the I-40 vee ditch.	\$ 210,710	H-11
Northwest Mesa Drainage Management Plan	Two 48" RCP, 200 feet long, crossing for proposed alignment of 98th St., approximately 2500 feet W. of Unser Blvd.	\$ 40,667	H-9
Northwest Mesa Drainage Management Plan	Concrete channel,4000 feet from proposed Ladera West Dam E. to the proposed alignment of 98th St.	\$ 2,683,398	H-9

Northwest Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
Northwest Mesa Drainage Management Plan	Concrete channel, 5000 feet from the proposed alignment of 98th ST. E. of Ladera Dam No. 12.	\$ 4,159,112	H-8
Northwest Mesa Drainage Management Plan	348 acre-feet detention facility, or equivalent, located upstream of Ladera Training Dike to prevent Ladera Detention Dams No. 12, 13 and 14 from flooding.	\$13,940,729	H-7
Northwest Mesa Drainage Management Plan	Four 10'x4' CBC, 200 feet long. Crossing at proposed alignment of 98th St. for proposed Ladera West Channel.	\$ 577,655	H-8
Northwest Mesa Drainage Management Plan	Three 10'x4' CBC, 200 feet long, crossing for proposed alignment of 98th St., just N. of Ladera Dams 5 and 6.	\$ 462,124	J-8
Northwest Mesa Drainage Management Plan	One 48" RCP, 200 feet long, crossing from proposed alignment of 98th St., just north of Ladera Dams 5 and 6.	\$ 61,616	J-8
West Bluff Drainage Study	Construct storm drain on Ladera Dr. from 90th St., E. to Dam No. 15 of the Ladera Drainage System.	\$ 54,052	J-9
West Bluff Drainage Study	Construct storm drain from Ladera Dr., Northwest to Dam no. 15 of the Ladera Drainage System.	\$ 64,539	H-10
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 129,078	H-10
Northwest Mesa Drainage Management Plan	Concrete channel,4000 feet from proposed Ladera West Dam E. to the proposed alignment of 98th St.	\$ 1,321,673	H-9
Amole Hubbell	Construct 10-yr lined, 100-yr overbank Amole Arroyo channel. Secate Blanco to Blake. Approx. 3,500 ft	\$ 2,111,940	N-9, N-10
Amole Hubbell	Construct Amole Arroyo soft lined channel. Amole Blake to Snow Vista.	\$ 2,450,000	N-9
Amole Hubbell	Construct Amole arroyo channel. Powerline to Westgate dam, approx. 2500 ft.	\$ 1,000,000	M-8

Northwest Drainage Area				
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps L-7	
Amole Hubbell	Add in-line detention basin in Powerline Channel.	\$ 938,640		
Amole Hubbell	Construct soft lined Rio Bravo channel. Rio Bravo channel to South Powerline.	\$ 500,000	L-8, M-8	
Amole Hubbell	Construct soft lined South Powerline Channel and Detention basin. Aprox. 9,500 ft and 70 ac-ft.	\$ 1,994,610	N-8, P-8	
Amole Hubbell	Dam #5 diversion storm drain. Construct Storm drain from Ladera Dam #5 to West I-40 (Proj. WB040 140D).	\$ 762,645	J-8	
West I-40	Construct West I-40/98th St. Detention Basin, NW corner of 98th St and I-40. Approx. 49 ac-ft.	\$ 1,126,368	J-8	
West I-40	Construct West I-40 Diversion lined channel. Approx. 13,500 ft from 98th St to East Amole Dam.	\$ 5,009,991	J-8, K-8	
West I-40	Construct W I-40/Unser Blvd. Detention Basin. Approx. 37 ac-ft.	\$ 1,138,101	J-9	
West I-40	West I-40 Diversion. Construct lined channel from Unser (Proj. WBO40 140D) to 98th St. (Proj. WBO040 074X). Approx 6,000 ft.	\$ 1,666,086	J-8, J-9	
	Service Area Total	\$55,015,528		

Southwest Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps
West Bluff Drainage Study	Construct storm drain on Iliff Rd. from Estancia Dr., E. to Coors Blvd., then N. to the I-40 vee ditch.	\$ 271,065	H-11
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct a channel from Snow Vista Channel to Powerline Channel. (7000 linear feet of channel improvement)	\$ 512,003	M-8
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct a channel from Snow Vista Channel to Amole Detention Basin. (2480 linear feet of channel improvements)	\$ 2,317,252	N-9
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct Snow Vista Channel from Benavides Rd. to Amole Arroyo. (4200 linear feet of channel improvements.)	\$ 1,903,457	M-9
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Storm drainage system upstream of Sage/Hower Road Pond	\$ 1,000,000	L-9
Northwest Mesa Drainage Management Plan	Two 48" RCP, 200 feet long, crossing for proposed alignment of 98th St., approximately 2500 feet W. of Unser Blvd.	\$ 82,566	H-9
West Bluff Drainage Study	West Bluff Outfall drainage systems.	\$ 161,348	J-9
West Bluff Drainage Study	Construct concrete channel from existing concrete box culverts under Unser Blvd. West to existing concrete box culverts under 98th St.	\$ 1,694,156	J-8
West Bluff Drainage Study	Construct concrete channel from existing concrete box culverts under Unser Blvd. West to existing concrete box culverts under 98th St.	\$ 84,708	J-9
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct Snow Vista Channel from Benavides Rd. to Amole Arroyo. (4200 linear feet of channel improvements.)	\$ 1,903,457	N-9
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 425,959	J-10
West Bluff Drainage Study	Construct concrete channel from confluence with West Mest Division, W. to existing concrete box culverts under Unser Blvd.	\$ 1,226,247	J-9
Southwest Drainage Area			
Drainage_Report	Proj_Description	Project_Cost2004	Zone_Maps

	Service Area Total	\$35,393,166	
West I-40	Dam 5 Arroyo. Construct lined channel from Atrisco Terrace to Ladera Dam #5.	\$ 4,352,943	J-7, J-8
West Bluff Drainage Study	West Bluff Outfall drainage systems.	\$ 1,452,134	J-9
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct a channel from Snow Vista Channel to Powerline Channel. (7000 linear feet of channel improvement)	\$ 512,002	N-9
Amole Watershed Drainage Management Plan And Amole Del Norte Re-Evaluation	Construct a channel from Snow Vista Channel to Powerline Channel. (7000 linear feet of channel improvement)	\$ 512,002	M-9
West Bluff Drainage Study	Construct concrete channel from existing concrete box culverts under Unser Blvd. West to existing concrete box culverts under 98th St.	\$ 1,609,448	J-9
West Bluff Drainage Study	Construct storm drain on Ladera Dr. from 90th St., E. to Dam No. 15 of the Ladera Drainage System.	\$ 1,026,981	J-9

Attachment 3

**Service Unit Calculations** 

# **Northwest Drainage Area**

Basin	AMDS	Land Use	Description	2000 Area in Square Feet	2025 Area in Square Feet	Difference	Acres		SU Factor	Service Units
NW		0		-	-					
NW		1	Residential - SF	192,455,574	335,376,941	142,921,366	3,281.02	3,281.02	0.73	2,395.15
NW		4	Office	461,445	3,240,263	2,778,818	63.79	63.79	0.8	51.03
NW		2	Major Retail/Commercial	12,951,970	19,133,450	6,181,480	141.91	141.91	0.9	127.72
NW		3	Mixed and Minor Commercial	14,498,441	47,119,810	32,621,369	748.88	748.88	0.9	674.00
NW		5	Industrial/Wholesale	7,487,931	16,435,634	8,947,704	205.41	205.41	0.8	164.33
NW		6	Institutions	1,253,395	5,653,099	4,399,704	101.00	101.00	0.9	90.90
NW		7	Schools/Universities	12,966,289	16,039,860	3,073,571	70.56	70.56	0.8	56.45
NW		9	Transportation and Major Utility Corridor	1,298,397	1,227,086	(71,311)	(1.64)		0.9	-
NW		12	Major Public Open Space	235,385,213	234,648,279	(736,934)	(16.92)		0.3	-
NW		13	Natural Drainage/Riparian Systems	30,799,081	30,240,210	(558,871)	(12.83)		0.2	-
NW		14	Urban Vacant/Abandoned	144,372,853	47,574,100	(96,798,753)	(2,222.19)		0.1	-
NW		15	Landfills/Sewage Treatment Plants	-	-	-	-	-	0.7	-
NW		16	Other Urban/Non Residential	3,748,563	9,595,558	5,846,995	134.23	134.23	0.9	120.81
NW		17	MF - Residential	17,048,064	28,415,851	11,367,788	260.97	260.97	0.9	234.87
NW		18	KAFB	-	-	-	-		0.9	-
			Totals in Square Feet	674,727,215	794,700,140	119,972,925	2,754.20			
			Totals in Acres	15,489.61	18,243.80			5008		3,915.25
			Totals in Square Miles	24.20	28.51			7.82		6.12

## **Southwest Drainage Area**

Basin	AMDS	Land Use	Description	2000 Area in Square Feet	2025 Area in Square Feet	Difference	Acres		SU Factor	Service Units
SW		0		3,341	2,755					
SW		1	Residential - SF	124,594,703	239,073,344	114,478,640	2,628.07	2,628.07	0.73	1,918.49
SW		2	Major Retail/Commercial	-	598,855	598,855	13.75	13.75	0.9	12.37
SW		3	Mixed and Minor Commercial	14,880,335	31,523,312	16,642,977	382.07	382.07	0.9	343.86
SW		4	Office	-	2,312,548	2,312,548	53.09	53.09	0.8	42.47
SW		5	Industrial/Wholesale	11,834,216	18,155,551	6,321,336	145.12	145.12	0.8	116.09
SW		6	Institutions	153,832	3,571,441	3,417,608	78.46	78.46	0.9	70.61
SW		7	Schools/Universities	5,611,133	9,494,978	3,883,844	89.16	89.16	0.8	71.33
SW		8	Airports	-	-	-	-	-	0.7	-
SW		9	Transportation and Major Utility Corridor	139,002	145,200	6,199	0.14	0.14	0.9	0.13
SW		10	Agriculture - IR	186,345	148,133	(38,212)	(0.88)	-	0.2	-
SW		11	Rangeland-Dry AG	126,682,071	29,402,278	(97,279,793)	(2,233.24)	-	0.2	-
SW		12	Major Public Open Space	10,783,959	10,671,883	(112,077)	(2.57)	-	0.3	-
SW		13	Natural Drainage/Riparian Systems	12,752,108	12,436,316	(315,792)	(7.25)	-	0.2	-
SW		14	Urban Vacant/Abandoned	77,761,623	19,500,663	(58,260,960)	(1,337.49)	-	0.1	
SW		15	Landfills/Sewage Treatment Plants	628,215	36,300	(591,915)	(13.59)	-	0.7	<u> </u>
SW		16	Other Urban/Non-Residential	2,980,304	4,653,222	1,672,918	38.40	38.40	0.9	34.56
SW		17	MF - Residential	3,976,626	11,114,021	7,137,395	163.85	163.85	0.9	147.47
SW		18	KAFB	-	-		-	-	0.9	
			Totals in Square Feet	392,964,472	392,838,043	(126,429)	(2.90)			
			Totals in Acres	9,021.22	9,018.32			3592		2,757.39
			Totals in Square Miles	14.10	14.09			5.61		4.31

# Tijeras Drainage Basin

Basin	AMDS	Land Use	Description	2000 Area in Square Feet	2025 Area in Square Feet	Difference	Acres		SU Factor	Service Units
Tijeras		1	Residential - SF	2,348,396	5,297,467	2,949,072	67.70	67.70	0.73	49.42
Tijeras		2	Major Retail/Commercial	64,155	73,806	9,652	0.22	0.22	0.9	0.20
Tijeras		3	Mixed and Minor Commercial	3,676,532	8,282,113	4,605,581	105.73	105.73	0.9	95.16
Tijeras		4	Office	2,876,092	3,299,613	423,520	9.72	9.72	0.8	7.78
Tijeras		5	Industrial/Wholesale	2,484,733	5,064,327	2,579,594	59.22	59.22	0.8	47.38
Tijeras		6 7	Institutions	-	118,920	118,920	2.73	2.73	0.9	2.46
Tijeras		1	Schools/Universities	-	-	-	-	-	0.8	
Tijeras		8	Airports	59,071,827	60,106,252	1,034,425	23.75	23.75	0.7	16.62
Tijeras		9	Transportation and Major Utility Corridor	-	-	-	-	-	0.9	-
Tijeras		10	Agriculture - IR	-	-	-	-	-	0.2	-
Tijeras		11	Rangeland-Dry AG	-	-	-	-	-	0.2	=
Tijeras		12	Major Public Open Space	12,686,866	12,807,511	120,645	2.77	-	0.3	-
Tijeras		13	Natural Drainage/Riparian Systems	1,828,797	2,082,398	253,601	5.82	5.82	0.2	1.16
Tijeras		14	Urban Vacant/Abandoned	27,939,674	16,683,101	(11,256,573)	(258.42)	-	0.1	-
Tijeras		15	Landfills/Sewage Treatment Plants	-	-	-	-	ı	0.7	-
Tijeras		16	Other Urban/Non-Residential	434,222	459,049	24,826	0.57	0.57	0.9	0.51
Tijeras		17	MF - Residential	102,515	104,672	2,156	0.05	0.05	0.9	0.04
Tijeras		18	KAFB	242,734	166,423	(76,311)	(1.75)	-	0.9	-
			Totals in Square Feet	113,756,543	114,545,652	789,108	18.12			
			Totals in Acres	2,611.49	2,629.61			2		220.73
			Totals in Square Miles	4.08	4.11			0.43		0.34

# Far NE Drainage Basin

		Land		2000 Area in	2025 Area in				SU	
Basin	AMDS	Use	Description	Square Feet	Square Feet	Difference	Acres		Factor	Service Units
Far NE		1	Residential - SF	198,833,959	229,961,873	31,127,914	714.60	714.60	0.73	521.66
Far NE		2	Major Retail/Commercial	7,391,326	8,778,138	1,386,812	31.84	31.84	0.9	28.65
Far NE		3	Mixed and Minor Commercial	21,781,631	35,601,343	13,819,712	317.26	317.26	0.9	285.53
Far NE		4	Office	18,552,165	22,121,493	3,569,328	81.94	81.94	0.8	65.55
Far NE		5	Industrial/Wholesale	44,519,613	55,274,072	10,754,458	246.89	246.89	0.8	197.51
Far NE		6	Institutions	3,747,874	7,272,669	3,524,796	80.92	80.92	0.9	72.83
Far NE		7	Schools/Universities	14,598,795	18,955,987	4,357,192	100.03	100.03	0.8	80.02
Far NE		8	Airports	9,681,816	1,113,684	(8,568,132)	(196.70)	-	0.7	-
Far NE		9	Transportation and Major Utility Corridor	1,447,647	1,340,725	(106,922)	(2.45)	ì	0.9	-
Far NE		10	Agriculture - IR	16,929	19,808	2,879	0.07	0.07	0.2	0.01
Far NE		11	Rangeland-Dry AG	1,034,267	1,039,145	4,878	0.11	-	0.2	-
Far NE		12	Major Public Open Space	47,900,727	47,431,984	(468,743)	(10.76)	ì	0.3	-
Far NE		13	Natural Drainage/Riparian Systems	24,707,972	23,942,470	(765,502)	(17.57)	-	0.2	-
Far NE		14	Urban Vacant/Abandoned	92,030,494	22,178,850	(69,851,644)	(1,603.57)	ì	0.1	-
Far NE		15	Landfills/Sewage Treatment Plants	334,329	290,400	(43,929)	(1.01)	-	0.7	-
Far NE		16	Other Urban/Non-Residential	6,360,611	7,689,025	1,328,414	30.50	30.50	0.9	27.45
Far NE		17	MF - Residential	19,027,744	28,445,506	9,417,762	216.20	216.20	0.9	194.58
Far NE		18	KAFB	-	-	-	-	-	0.9	-
			Totals in Square Feet	511,967,899	511,457,171	(510,728)	(11.72)			
			Totals in Acres	11,753.17	11,741.44					1,473.79
			Totals in Square Miles	18.36	18.35			2.84		2.30

Attachment 4

**Drainage Impact Fee CIP 2005 to 2012** 

DF	RAINAGE FACILITIES IMPACT FEE CAPITAL IMPLEMENTATION PROGRAM 2005-201 (Note: All projects will be phased)	2
Service Area	Project	Cost
Southwest	>Construct phased improvements to the South Powerline channel and detention basins within the municipal limits	\$1,100,000
	> Construct phased improvements to the Snow Vista trunk between the Amole Basin and the existing improvements	\$5,131,009
	> Construct phased improvements to the storm drainage trunk upstream of Sage/Tower Road Pond	\$1,744,543
	> Construct phased improvements to West Bluff trunk (I-40 diversion) west of Unser and associated detention ponds within the municipal limits	\$3,386,466
	> Advance ROW acquisition	\$1,262,446
Total		\$12,624,463
Tijeras	> Construct phased improvements to the Tijeras arroyo between KAFB and Four Hills Road, within the municipal limits	\$844,925
	> Advance ROW acquisition	\$93,881
Total		\$938,806
Far Northeast	> Construct phased improvements to the North and South La Cueva and El Camino trunk between the North Diversion Channel and the municipal limits to the east	\$3,879,203
	> Advance ROW acquisition	\$431,023
Total		\$4,310,226
Northwest	> Construct phased improvements to the Piedras Marcadas trunk and diversion of the Piedras Marcadas to the Calabacillas Arroyo	\$6,768,918
	> Construct phased improvements to Boca Negra/Mariposa trunk and associated detention ponds	\$10,576,436
	> Construct phased improvements to the storm drainage trunk(s) northwest of Mirehaven diversion and associated detention ponds	\$3,807,517
	> Advance ROW acquisition	\$2,350,319
Total		\$23,503,190
Grand Total		\$41,376,685