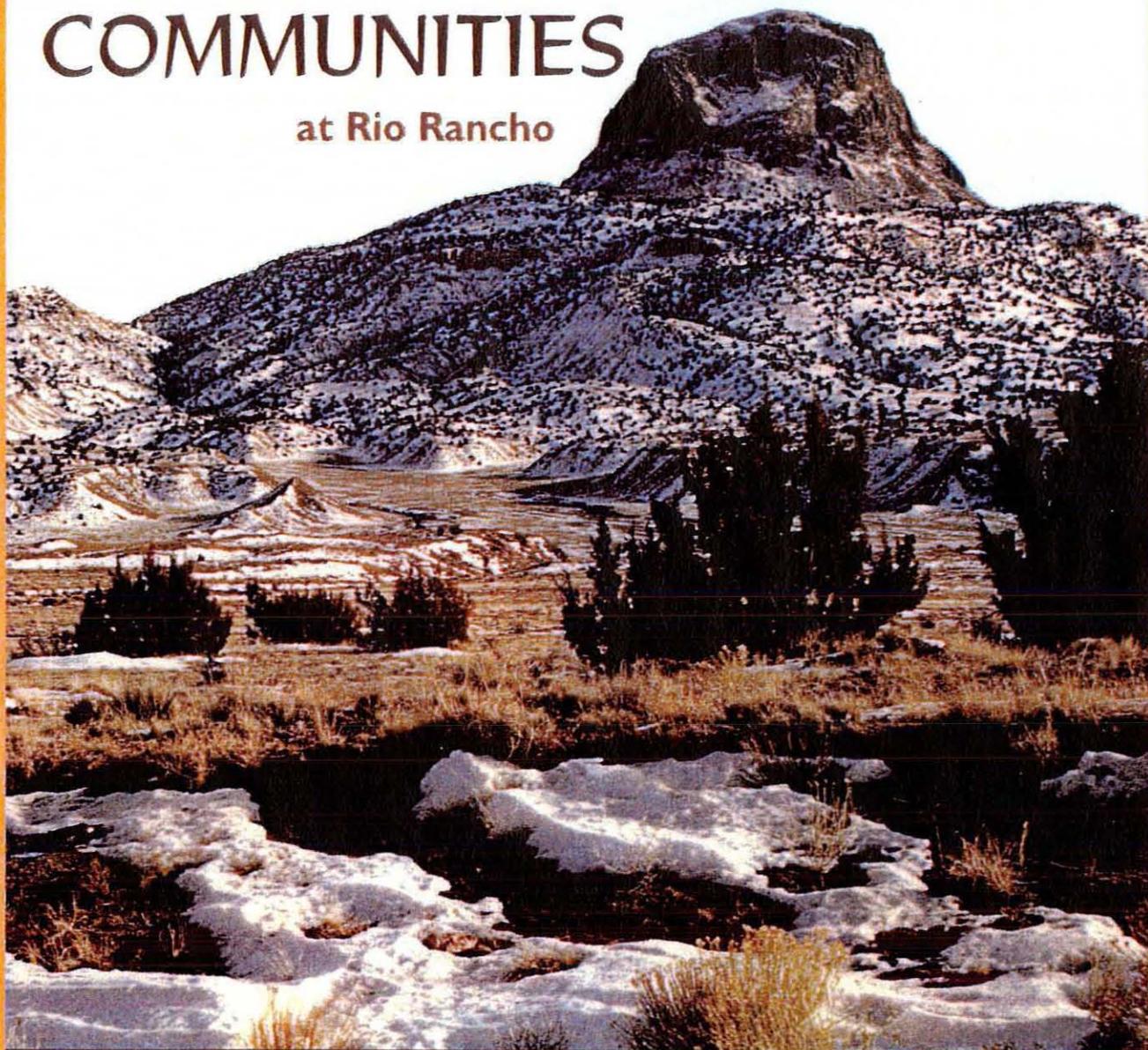


# CABEZON COMMUNITIES

at Rio Rancho



*Prepared For:*

**Curb, Inc.**

**Consensus Planning, Inc.**

**Wilson & Company**

**Adopted April 25, 2007**



CITY OF RIO RANCHO  
RESOLUTION

RESOLUTION NO. 36

ENACTMENT NO. 07-037

1 RESOLUTION AMENDING THE CABEZON COMMUNITIES MASTER PLAN AND  
2 AMENDING THE CITY OF RIO RANCHO'S VISION 2020 INTEGRATED  
3 COMPREHENSIVE PLAN, PREFERRED GROWTH SCENARIO MAP.  
4

5 **WHEREAS:** The State of New Mexico has granted the City of Rio Rancho the power,  
6 authority, jurisdiction and duty to enforce and carry out the provisions of law  
7 relating to planning, platting and zoning pursuant to Section 3-19-1 et. seq.  
8 NMSA 1978, as amended; and  
9

10 **WHEREAS:** The Governing Body of the City of Rio Rancho recognizes the need for long-  
11 range, integrated comprehensive planning to direct future growth and  
12 development of the City; and  
13

14 **WHEREAS:** The Governing Body of the City of Rio Rancho has adopted the *Vision 2020*  
15 *Integrated Comprehensive Plan*, a plan which establishes a hierarchy of  
16 plans that includes Level 4 Master Plans which consider a smaller  
17 geographic area within the City; and  
18

19 **WHEREAS:** The *Vision 2020-Integrated Comprehensive Plan* is intended to be used as a  
20 living, breathing document and may be amended from time to time to reflect  
21 changing conditions and/or the desires of the Governing Body; and  
22

23 **WHEREAS:** The Governing Body of the City of Rio Rancho amended the *Vision 2020*  
24 *Integrated Comprehensive Plan, Preferred Growth Scenario Map* with the  
25 adoption of the *Cabazon Communities Master Plan* on April 9, 2003  
26 (Resolution No. 18, Enactment 03-020); and  
27

28 **WHEREAS:** The Governing Body of the City of Rio Rancho amended the *Vision 2020*  
29 *Integrated Comprehensive Plan, Preferred Growth Scenario Map* and  
30 amended the *Cabazon Communities Master Plan* on January 26, 2005  
31 (Resolution No. 12, Enactment 05-011); and  
32

33 **WHEREAS:** The Governing Body of the City of Rio Rancho amended the *Vision 2020*  
34 *Integrated Comprehensive Plan, Preferred Growth Scenario Map* and  
35 amended the *Cabazon Communities Master Plan* on May 10, 2006  
36 (Resolution No. 36, Enactment 06-036); and  
37

38 **WHEREAS:** The Governing Body of the City of Rio Rancho has determined that this  
39 amendment to the *Cabazon Communities Master Plan* conforms to the  
40 *Vision 2020 Integrated Comprehensive Plan*; and  
41

42 **WHEREAS:** The Governing Body of the City of Rio Rancho recognizes that this  
43 amendment to the *Cabazon Communities Master Plan* will facilitate the

1 development of the City's first hospital.

2  
3 **NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF**  
4 **RIO RANCHO:**

5  
6 That the Governing Body of the City of Rio Rancho hereby approves an  
7 amendment to the *Vision 2020 Integrated Comprehensive Plan, Preferred*  
8 *Growth Scenario Map* and an amendment to the *Cabazon Communities*  
9 *Master Plan* as attached hereto as Exhibit A and incorporated herein by this  
10 reference and subject to the following conditions:

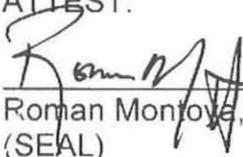
- 11 1. A revised Drainage Master Plan, including a revised Drainage  
12 Implementation Plan, shall be approved by SSCAFCA and the City of Rio  
13 Rancho prior to the approval of any final plats, building permits, or  
14 commencement of development on Cabazon, Tracts 13A, 14A-1 or 14A-  
15 2;
- 16 2. A revised Transportation Master Plan, including a revised Traffic Impact  
17 Analysis, shall be approved by the City of Rio Rancho prior to the approval  
18 of any final plats, building permits, or commencement of development on  
19 Cabazon, Tracts 13A, 14A-1 or 14A-2; and,
- 20 3. A revised Development Agreement shall be approved by the City of Rio  
21 Rancho prior to the approval of any final plats, building permits, or  
22 commencement of development on Cabazon, Tracts 13A, 14A-1 or 14A-  
23 2.

24  
25 ADOPTED THIS 25<sup>TH</sup> DAY OF APRIL, 2007.

26  
27  
28   
29 Michael Williams, Deputy Mayor

30  
31  
32 Date 4-30-07

33  
34 ATTEST:

35   
36 Roman Montoya, City Clerk  
37 (SEAL)  
38

# CABEZON COMMUNITIES

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## Sections

1. Introduction
2. Design Guidelines
3. Potable Water System Master Plan
4. Wastewater System Master Plan
5. Transportation Master Plan
6. Drainage Master Plan



## I. INTRODUCTION

This document is prepared as a Master Plan for the western portion of Unit 16 of Rio Rancho Estates within the City of Rio Rancho, for the area now known as Cabezon or Cabezon Communities. (See Figure 1, Unit 16 Location Map). The Cabezon area has been approved for future redevelopment under an amended Unit 16 Redevelopment Plan, as approved by the Rio Rancho Governing Body on January 22, 2003. The Redevelopment Plan was approved along with a Conceptual Plan that created an overall land use strategy for the redevelopment of the area. The Redevelopment Plan anticipated a subsequent Master Plan submittal to the City (this plan), and required that it substantially conform to the approved Conceptual Plan. This Master Plan is in substantial conformance with that previously approved plan, and it provides additional detail in the areas of:

- Ø Master Plan for designated land uses, and anticipated zoning categories for those land uses (including parks, and open space as well as other developed areas, see Figure 2) and a generalized phasing plan for the area
- Ø Compliance with the Vision 2020 Integrated Comprehensive Plan
- Ø Design guidelines to provide an overview of design elements for Cabezon as it develops in the future
- Ø A water plan for Cabezon that addresses both quality and quantity issues
- Ø A sewer plan for Cabezon that incorporates a City request for additional land for future wastewater treatment facility expansion
- Ø A transportation plan for the area that addresses both internal and external access issues
- Ø An overall drainage plan that addresses existing and future conditions of the area
- Ø A fiscal impact analysis showing substantial benefit to the City of Rio Rancho as a result of the development at Cabezon Communities (under separate cover in conjunction with a development agreement).

A Master Plan and development agreement for Cabezon have been approved by the City of Rio Rancho and zoning was established to conform with the Master Plan and bulk plats. Subsequent approvals will be needed for subdivisions, site plans in SU Commercial/Office, and SU for Hospital and Related Uses areas, and for infrastructure as the community develops over time in an orderly phased approach. This Master Plan provides the overall framework to guide that future development.

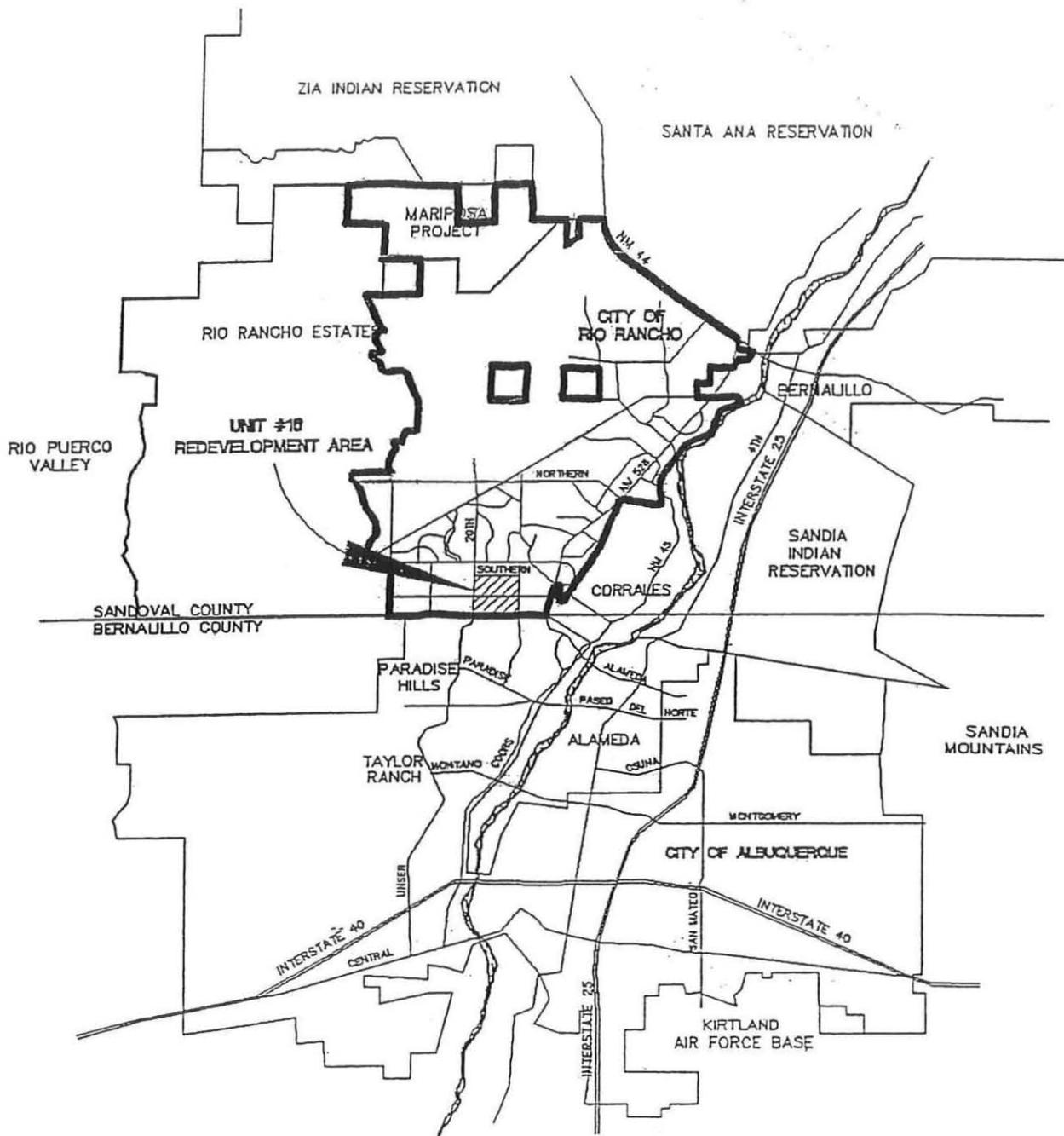


Figure 1

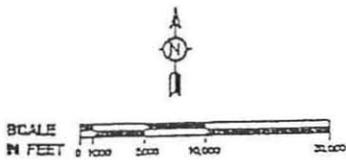
### REGIONAL LOCATION MAP

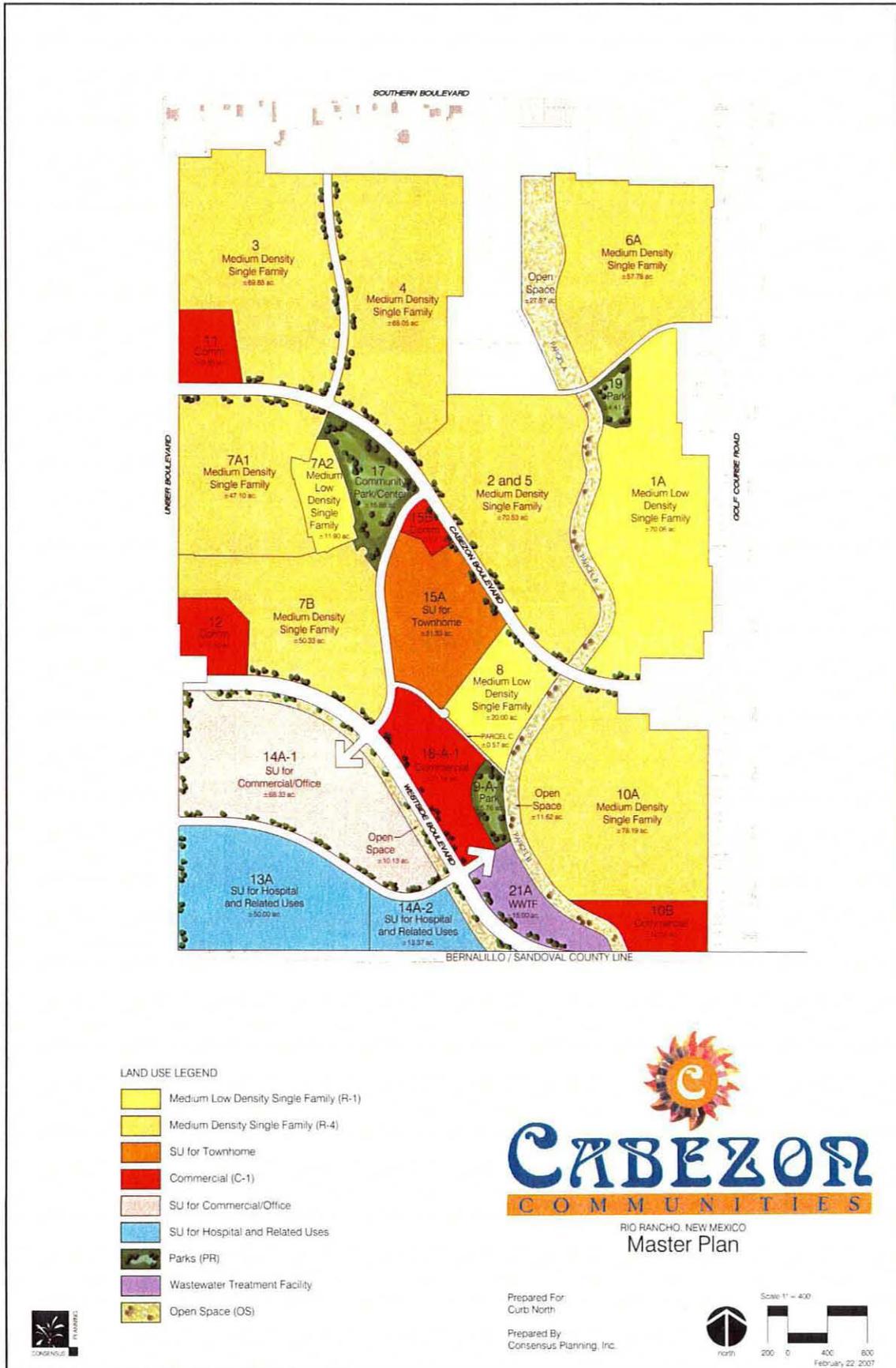


- Proposed Project Location

### UNIT #16 WEST REDEVELOPMENT PLAN

CITY DEVELOPMENT DEPARTMENT





- LAND USE LEGEND
- Medium Low Density Single Family (R-1)
  - Medium Density Single Family (R-4)
  - SU for Townhome
  - Commercial (C-1)
  - SU for Commercial/Office
  - SU for Hospital and Related Uses
  - Parks (PR)
  - Wastewater Treatment Facility
  - Open Space (OS)



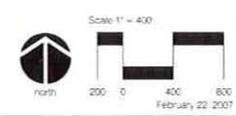
# CABEZÓN

## COMMUNITIES

RIO RANCHO, NEW MEXICO  
Master Plan

Prepared For  
Curb North

Prepared By  
Consensus Planning, Inc.



The Master Plan was adopted in April 2003 and amended several times to adjust for changing conditions encountered during development. This latest amendment submitted to the City of Rio Rancho in January 2007, primarily changes land uses in the southwestern portion of the site to allow Rio Rancho's first hospital and associated uses. A complete record of the amendments can be obtained from the City of Rio Rancho.

### **Public Improvement District**

The Developer is using both conventional private financing as well as a public improvement district pursuant to the Public Improvement District Act, Sections 5-11-1 through 5-11-27 NMSA 1978 (2001 Repl. Pamp.) (the "PID Act") to fund certain amenities within Unit 16 West such as trails, parks, landscaping recreation and park facilities, and storm drain improvements where impact fee credits available under the City's Impact Fee Ordinance (Article 11, Chapter 9, Rio Rancho Comprehensive Ordinances) would cover only a portion of any of the cost of such. The Developer will not use money raised by a PID to fund those amenities (or portions thereof) for which it receives impact fee credits. The City has approved a petition and formation resolution necessary for the creation of a public improvement district for the purpose of financing these types of public infrastructure improvements following approval of the Master Plan and development agreement covering infrastructure and impact fees and credits and after the City adopted its PID procedures.

### **LAND USE and ZONING**

This land use and zoning section of the Cabezon Master Plan has been prepared in substantial conformance to the Conceptual Plan approved as part of the Unit 16 West Redevelopment Plan. The Conceptual Plan was approved by the City of Rio Rancho Governing Body on January 22, 2003.

The Master Plan incorporates sections provided by the project engineers and is accompanied by a companion document prepared by the fiscal impact analyst, as well as additional description in all sections in response to City of Rio Rancho staff comments. A land use table depicting acreages and land use categories for all parcels is included along with the final color master plan graphic. There is a design guideline section of this Master Plan that further defines site development design goals for both residential and non-residential land uses. The design guidelines will be expanded into a privately enforced set of covenants for the property and will include greater detail at that time.

The intent of the Master Plan is to provide for a variety of land uses and neighborhood types, including an open space network and park system, a diversity of housing choices, and commercial and medical areas for employment opportunities. The primary goal is to allow for multiple builders on lots of varying sizes, including affordable housing and custom home lots, within neighborhoods that are designed to be walkable and include access to open space, parks, and neighborhood commercial services.

As noted above, design guidelines are included in this Master Plan for residential and non-residential uses. Development design goals refer back to the underlying

zoning as defined in the City’s Zoning Ordinance. The City of Rio Rancho will only be enforcing standard zoning requirements. The developer will establish a more stringent set of requirements for private enforcement. Once the Master Plan and accompanying development agreement are approved by the Governing Body, zoning will be sought for Cabezon consistent with that indicated in this Master Plan, subject to any conditions imposed by the Governing Body.

The land use table showing specific acreage amounts for each land use is shown below:

Land Use	DU's/ac.	Size (acres)	% of Total	% of Residential
Single Family Residential <sup>1</sup>		543.84	60.1%	
Medium Low Density (R-1)	2 to 4	101.98	11.3%	19%
Medium Density (R-4)	4 to 8	441.86	48.8%	81%
SU for Townhome/PUD <sup>2</sup>	10	31.33	3.5%	
SU for Commercial/Office (SU for Commercial/Office) <sup>4</sup>		68.33	7.5%	
Commercial (C-1)		56.87	6.3%	
SU for Hospital and Related Uses (SU for Hospital and Related Uses) <sup>4</sup>		63.37	7.0%	
Community Park/Center (PR)		15.88	1.8%	
Neighborhood Parks (PR)		10.17	1.1%	
Water Treatment Facility (PR)		15.00	1.7%	
Open Space (OS)		50.29	5.5%	
Right-of-Way <sup>3</sup>		49.67	5.5%	
Totals		904.75	100.0%	

<sup>1</sup> Single Family Residential units are capped at 3,500.  
<sup>2</sup> Residential units included in the higher density SU for Townhome area is not included in the overall Single Family residential cap.  
<sup>3</sup> Right-of-Way includes only major roadway network as illustrated on the plan, and does not include roadways within individual subdivisions.  
<sup>4</sup> No more than a combined total of 1,000 dwelling units may be constructed for all areas zoned SU for Commercial/Office and SU for Hospital and Related Uses.

## RESIDENTIAL LAND USES

### Medium Low Density Single Family

This land use area covers approximately 101.98 acres of land within the Cabezon Master Plan and is located on the eastern portion of the plan area slightly offset from Golf Course Road. It is zoned R-1, as defined and regulated in the City of Rio Rancho’s Zoning Ordinance, and will include neighborhoods with 2-4 dwelling units per acre.

Permissive Uses include:

- Ø One single family dwelling unit per lot (see City Zoning Ordinance for design standards)
- Ø Accessory buildings or structures (see City Zoning Ordinance for design standards)
- Ø Accessory living quarters
- Ø Noncommercial gardens, swimming pools, tennis courts
- Ø Parks, open space, public utilities and facilities
- Ø Home occupations
- Ø Construction trailers (see City Zoning Ordinance for restrictions)
- Ø Temporary, emergency, construction, and repair residences (see City Zoning Ordinance for restrictions)
- Ø Family day care home with capacity of six or less
- Ø Second kitchen (see City Zoning Ordinance for restrictions)
- Ø Single family dwelling unit or manufactured/modular unit may be used as a model home or sales office (see City Zoning Ordinance for restrictions)
- Ø Community residential care facility up to 10 persons, including staff residents (see City Zoning Ordinance)

Conditional Uses include:

- Ø Churches and other places of worship, Sunday school buildings, and parish houses
- Ø Hospitals and private institutions of an educational nature (see City Zoning Ordinance for restrictions)
- Ø Recreation parks
- Ø Family day care home with a capacity of 7 or more
- Ø Hobby breeders (see City Zoning Ordinance for restrictions)

### **Medium Density Single Family**

This land use area covers approximately 441.86 acres, the largest category in Cabezon. It is zoned R-4, as defined in the City of Rio Rancho's Zoning Ordinance. Development standards including standard lot size, height, and setback requirements will be governed by the R-4 zone. The intent is to provide a range of lot sizes from 4000–8000 square feet, and an overall density of 4-8 dwelling units per acre. Affordable housing choices will typically be offered within the smaller lots, but will be mixed into neighborhoods that include all income ranges and house sizes to promote the stabilization of the neighborhood. A variety of lot sizes and housing products will be provided by multiple home builders, including some custom homes. Attractive walls, entries, and streetscapes will be designed and landscape requirements are included in the design guidelines section.

Permissive Uses include:

- Ø Same as Medium Low Density Residential, except no multi-family dwellings; detached private garage may be a one-car as set forth in the City's R-1 zone (see City Zoning Ordinance for design standards)

Conditional Uses:

- Ø Same as Medium Low Density Residential

The single family land uses together comprise 543.82 acres of the Master Plan area. The Rio Rancho Governing Body approved a cap of 3,500 dwelling units as the maximum allowed within the single family residential area (R-1 and R-4 zones).

## **NON-RESIDENTIAL LAND USES**

### **Commercial**

Commercial areas within Cabezón are zoned C-1 and are clustered into nodes, rather than strips. The intersection of Unser and Southern Boulevards is designated as a growth node in the City's 2020 Integrated Comprehensive Plan and Cabezón is located at the southeast corner of that designated area. A substantial amount of commercial use is provided along Unser Boulevard in order to provide local services to Cabezón residents, nearby neighbors, and commuters traveling Unser Boulevard. The intent is to provide a pedestrian orientation to these areas with direct access to adjacent neighborhood areas and encourage commercial activity centers.

Permissive uses include:

- Ø Stores for the sale of retail goods and products
- Ø Restaurants, bars, and lounges
- Ø Repair shops – electrical, radio, and television appliances, keys, and similar articles
- Ø Shops – dressmaking, tailoring, laundry, dry cleaning, photo, pet, and similar trades
- Ø Banks, theaters, and office buildings
- Ø Churches and other places of worship, Sunday school buildings, and parish houses
- Ø Bakeries and confectioneries where goods are sold at retail prices
- Ø Parks, recreational parks, open spaces, and public utilities
- Ø Nursery schools and daycare facilities
- Ø Undertaking establishments
- Ø Club houses, buildings for fraternal organizations, nonprofit public service organizations
- Ø Medical complexes, professional offices associated with medical complexes, and veterinarians
- Ø Construction trailers (see City Zoning Ordinance for restrictions)
- Ø Photocopying and blueprinting
- Ø Public facilities
- Ø Hospitals
- Ø Nursing homes and similar institutions
- Ø Temporary structures and enclosures used in construction of a building and used for storage of equipment and material (see City Zoning Ordinance for restrictions)

- Ø Drive-in or drive-up window restaurants and/or convenience stores provided drive-up liquor dispensing windows are excluded at such establishments
- Ø Bowling alleys and other indoor recreational uses
- Ø Residential uses with the structures
- Ø Offset press printing (see City Zoning Ordinance for restrictions)
- Ø Adults-only bookstores, adults-only motion picture theaters, adult entertainment centers, massage parlors, and saunas provided that such uses meet the requirements and/or restrictions set forth in the City Zoning Ordinance

Conditional Uses:

- Ø From Division G of the S.I.C. (Retail Trade) the following major group number: Major Group 55: Automotive dealers and gasoline service stations (see City Zoning Ordinance for restrictions)
- Ø Private schools
- Ø Temporary model home/sales office (see City Zoning Ordinance for restrictions)
- Ø Recycling collection centers (see City Zoning Ordinance for restrictions)

**SU for Commercial/Office**

The SU Commercial/Office area within Cabezon will be zoned SU for Commercial/Office uses. The intent is to provide for most uses that are allowed in the City's C-I and O-I districts. Specifically, adult only uses, used car dealerships and trailer sales are not allowed in the SU for Commercial/Office district. Development in the SU Commercial/Office area should be pedestrian orientated, complement the adjacent hospital, and may include buildings up to 5-stories in height. Except for the allowed height of buildings, the development standards for the district shall be the same as the City's C-I zone district and will be supplemented by the additional design standards found in this master plan. Site Plan approval by the Governing Body is required prior to development in accordance with applicable City codes.

Permissive uses include:

- Ø Stores for the sale of retail goods and products
- Ø Restaurants, including restaurants with alcoholic beverage sales for on-site consumption
- Ø Repair shops – electrical, radio, and television appliances, keys, and similar articles
- Ø Shops – dressmaking, tailoring, laundry, dry cleaning, photo, pet, and similar trades
- Ø Banks and financial institutions
- Ø Theaters and motion picture theaters, excluding adult-only theaters
- Ø Professional and medical offices
- Ø Churches and other places of worship, Sunday school buildings, and parish houses
- Ø Bakeries and confectioneries where goods are sold at retail prices

- Ø Parks, recreational parks, open spaces, and public utilities, including major storm drainage facilities
- Ø Nursery schools and daycare facilities
- Ø Undertaking establishments
- Ø Club houses, buildings for fraternal organizations, nonprofit public service organizations
- Ø Medical complexes, professional offices associated with medical complexes, and veterinarians
- Ø Construction trailers
- Ø Photocopying and blueprinting
- Ø Governmental and similar public facilities
- Ø Hospitals
- Ø Nursing homes and similar institutions
- Ø Temporary structures and enclosures used in construction of a building and used for storage of equipment and material
- Ø Drive-in or drive-up window restaurants and/or convenience stores provided drive-up liquor dispensing windows are excluded at such establishments
- Ø Bowling alleys and other indoor recreational uses
- Ø Multiple-family residential uses in conjunction with a retail or office use and located above the first story of the building (no ground floor residential units), not to exceed a density of 24 dwelling units per acre
- Ø Offset press printing
- Ø Massage and suana as part of a bonafide, medical or physical therapy office
- Ø Buildings up to 75 feet in height or 5 stories above ground level, whichever is less

#### Conditional Uses:

- Ø From Division G of the S.I.C. (Retail Trade) the following major group number: Major Group 55: Automotive dealers and gasoline service stations, except:
  - Used automobile sales as a primary use
  - Trailer sales
- Ø Private schools
- Ø Temporary model home/sales office

#### Setback Standards:

- I. All buildings shall be setback a minimum of 35 feet from Unser Boulevard and a minimum of 10 feet from all other public rights-of-way.

### **SU for Hospital and Related Uses**

This land use area is intended to accommodate a hospital, medical offices and laboratories, medical ancillary uses, and supporting commercial activities, such as restaurants, newstands, flowershops, gift shops, and similar uses. Except for the height standards and the buffer/setback standards, the development standards for the district shall be the same as the City's C-1 zone district and will be supplemented by the additional design standards found in this master plan.

Site Plan approval by the Governing Body is required prior to development in accordance with applicable City codes.

Permissive Uses include:

- Ø Hospitals, not to exceed 130 feet in height
- Ø Heliport, ground level, for ambulance transfer service
- Ø Medical offices
- Ø Medical laboratories
- Ø Medical clinics
- Ø Medical care facilities, including but not limited to; physical therapy, health center/gyms, healthplexes, day surgery, and similar facilities
- Ø Substance abuse treatment facilities, outpatient and residential
- Ø Pharmacies
- Ø Optometric laboratories
- Ø Research facilities
- Ø Medical schools and training facilities, including but not limited to nursing
- Ø Professional offices for health care related services
- Ø Offices for social services
- Ø Restaurants up to 2,000 square feet, without drive-throughs
- Ø Newstands, florists, and gift shops
- Ø Banks and credit unions, without drive-throughs
- Ø Retail stores, 60,000 square feet or less
- Ø Hospitality/Hotels
- Ø Hospice facilities
- Ø Nursery schools and daycare facilities, including adult daycare
- Ø Residential care and treatment facilities
- Ø Assisted living facilities
- Ø Multiple-family residential, incidental to a medical use, or to house families during treatment of a family member, or for medical staff, and not to exceed 24 dwelling units per acre
- Ø Churches, mosques, temples, and other places of worship
- Ø Parks, playgrounds, and open spaces
- Ø Ambulance base station
- Ø Multiple-story parking garages
- Ø Public transportation station
- Ø Central utility plant
- Ø Construction trailers
- Ø Temporary structures and enclosures used in construction of a building and used for storage of equipment and material
- Ø Major storm drainage facilities
- Ø Public utilities
- Ø Wireless communications facilities in conformance with the City's wireless telecommunications facilities ordinance
- Ø Buildings, up to 75 feet in height or 5 stories above ground level, whichever is less, except hospitals which may be up to 130 feet in height with no restriction on the number of floors

## Conditional Uses:

- Ø Drive-through restaurants
- Ø Retail stores, greater than 60,000 square feet

## Buffer and Setback Standards:

1. All buildings shall be setback a minimum of 35 feet from Unser Boulevard.
2. All buildings 35 feet or less in height shall be setback a minimum of 35 feet from Black Arroyo Road. All buildings over 35 feet in height shall be setback 35 feet plus one additional foot for every foot of building height over 35 feet, up to a maximum setback of 100 feet, from Black Arroyo Road.
3. All buildings shall be setback a minimum of 10 feet from any public right-of-way not described above.
4. Buffer landscaping. Shall be as provided for in the Cabezon Master Plan Landscape Design Guidelines.
5. Buffer walls. A buffer wall shall be a minimum of six feet in height and shall be constructed of masonry, sealed adobe, brick or other solid material where SU for Hospital and Related Uses property is immediately adjacent to residential property. Where separated by a thoroughfare, no wall shall be required.

## **PARKS and OPEN SPACE**

### **Parks**

The Cabezon Master Plan contains two neighborhood park sites and a community-scale park site, distributed throughout the area to serve the needs of the community. Each of the parks is located to provide the opportunity for joint use with drainage and water quality requirements, however, parks will not be totally encumbered by drainage facilities, and will allow adequate areas for recreational uses. The community park is envisioned to include community facilities such as a community center and recreational uses such as ballfields. The community park is located adjacent to a mixed-density area, providing the opportunity to create a unique destination-oriented activity center for the Cabezon Community. The primary focus for the neighborhood parks is to provide space for active recreation, and will include a combination of features such as, children's play areas, picnic facilities, court games, minor skate facilities, practice areas, walking paths, etc. The actual facility program for each of the parks will be coordinated with the City of Rio Rancho Parks and Recreation Department. The parks will be linked through a combination of hiking, biking, and pedestrian trails. Park land and park improvements will be paid for and developed in accordance with the approved development agreement.

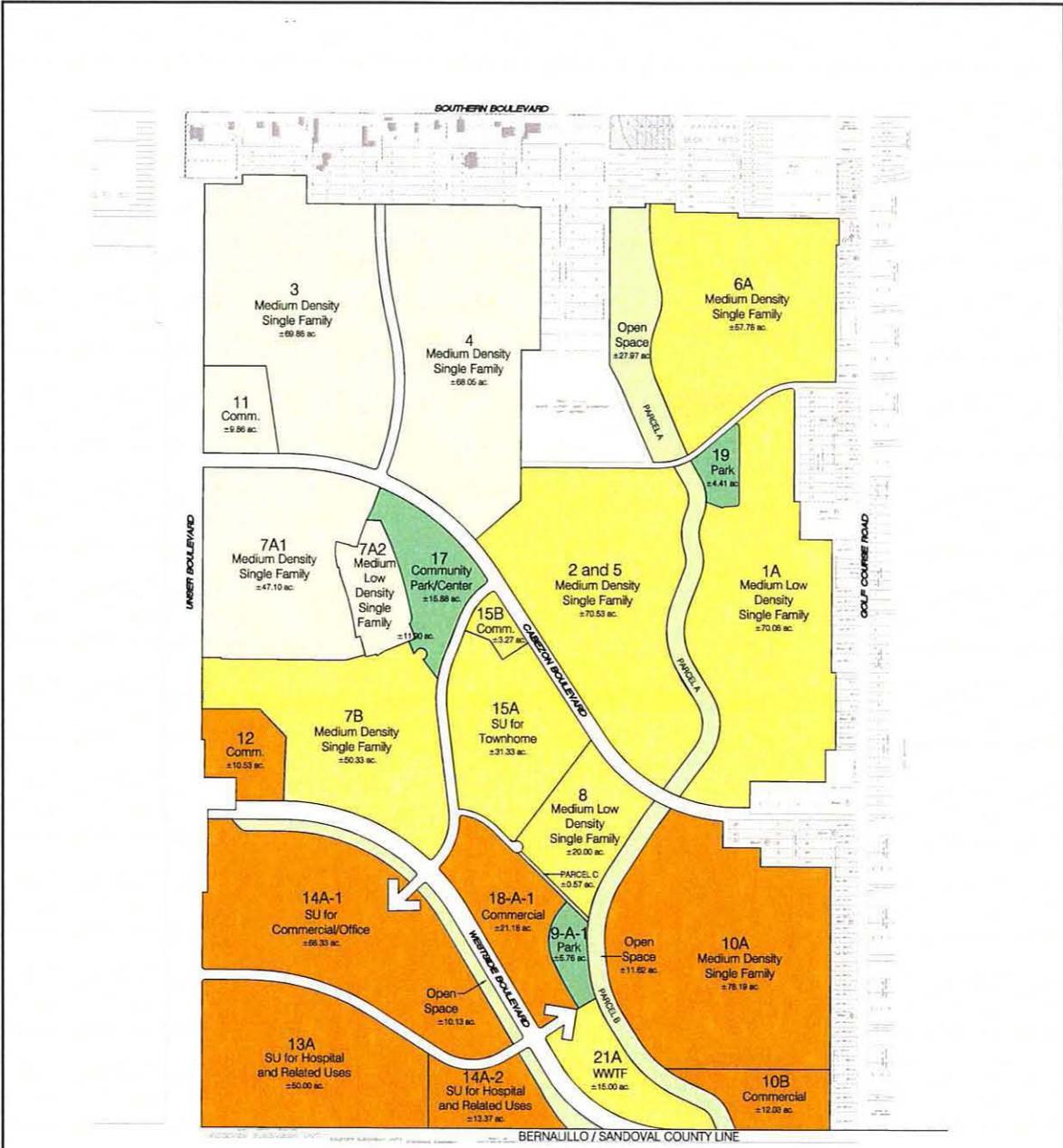
### **Developed Open Space**

The corridors created by the east and west branches of the Black Arroyo presents an opportunity to develop a system of multi-use open space. The corridors will serve a drainage and water quality function, provide for utility co-location, provide for community open space, and include a network of trails for connecting developments within Cabezon Communities. The drainage and utility

improvements are described in detail in the respective sections of this Master Plan. The west channel will be a hard-lined drainage channel and will be located within a wide corridor thus allowing substantial room for developed open space improvements (Proto-typical channel cross-section are located at the end of the Design Guidelines). Passive recreational activities, such as hiking/biking/pedestrian trails, picnic facilities, and seating opportunities will be provided in these zones. Disturbed areas will be revegetated with a combination of native grasses, wildflowers, shrubs and trees. The landscape will be established using a temporary irrigation system to ensure proper coverage. The plan provides 76.34-acres of open space, which exceeds the City's goal of seven acres per 1,000 residents, based on the maximum buildout of 3,735 residential units.

### **Wastewater Treatment Facility**

A 15-acre wastewater treatment facility site will be located at the southerly end of Cabezon in response to a request from the City of Rio Rancho. The City must ensure that the northerly boundary of the site which is adjacent to a residential parcel must be bermed and densely landscaped to screen the facility from nearby residents. Specific screening requirements are included in the design guidelines. The City and developer's fiscal contributions for wastewater treatment are included in the development agreement.



PHASING LEGEND

- Phase 1
- Phase 2
- Phase 3



# CABEZÓN

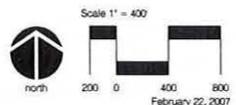
COMMUNITIES

RIO RANCHO, NEW MEXICO  
Phasing Plan



Prepared For:  
Curb North

Prepared By:  
Consensus Planning, Inc.



## **VISION 2020 INTEGRATED COMPREHENSIVE PLAN**

The Cabezon Master Plan adheres to the City's Vision 2020 Integrated Comprehensive Plan (2020 ICP). Within the 2020 ICP, the principles, policies and action statements for the City of Rio Rancho provide general development guidelines to which all development must adhere. The 2020 ICP is organized around eight fundamental principles or areas of concern to future development in the community. These categories are:

- Ø Land Use-Fiscal Analysis
- Ø Urban Design
- Ø Transportation and Circulation
- Ø Infrastructure and Capital Facilities
- Ø Environmental Sustainability
- Ø Housing
- Ø Community Services and Public Facilities
- Ø Economic Development

Within each of these eight principles, the 2020 ICP lists specific policies and actions that are seen as desired outcomes for future development in the City. The Cabezon Communities project will provide a means of implementation for these policies. Specific examples were included in the Redevelopment Plan for Unit 16 that was adopted by the Governing Body on January 22, 2003. Those specific policies are not being repeated within this document, since the Redevelopment Plan may be used as a reference for that purpose. Rather, a brief summary of how the Cabezon plan meets the overall principle and intent of the policies and action statements is included below.

### **Land Use-Fiscal Analysis**

A land use plan providing for mixed uses and a place for residents to live, work, shop, and play without leaving the City has been provided for at Cabezon. The land use plan in this document substantially conforms with the conceptual plan approved by the Governing Body at the time of Redevelopment Plan approval. The land use mix also conforms to the overall goals for the City, and to the specific requirements conditioning the approval of the Redevelopment Plan. A land use plan graphic and land use table depicting acreage amounts and units by parcel has been included. A description of future zoning categories that can implement the land use plan has also been included. Finally, a fiscal analysis for Cabezon is included as a companion document to the Master Plan. The fiscal analysis shows overall surplus revenues in all City fund categories, substantial increases in property taxes, increased gross receipts taxes, and large sums devoted to impact fee revenues to the City.

### **Urban Design**

The Urban Design Framework Plan in the 2020 ICP shows open space and park sites along arroyos consistent with the Cabezon Master Plan (and the prior Conceptual Plan), and it also showed a proposed growth node at this location. Urban design policies in the 2020 ICP also require design guidelines for each Master Plan to ensure that future development will have to be carefully designed to enhance the overall community image and require quality development as a

minimum for the community. These design guidelines have also been included as a section to this Master Plan. The developer will provide additional urban design protection to the community by allowing for and creating a Cabezon Communities Design Review Committee (CCDRC) that will require review and approval of site plans, subdivisions, and design details prior to any construction. This design review process is in addition to that provided by the City of Rio Rancho through zoning and plan approval processes already required.

### **Transportation and Circulation**

A transportation and circulation plan and summary is provided as a section of this Master Plan. The transportation system is consistent with the most current MRCOG adopted transportation plan, and has been designed to efficiently serve both Cabezon and the larger community with a multi-modal transportation network. Trails, bikeways, and paths will be incorporated into the transportation plan along major transportation facilities, arroyos, and as connecting linkages where non-vehicular transportation volumes may warrant them. Public transportation considerations can also be included in site specific transportation plans including review for future park and ride facilities, bus bays, or other solutions for future transit development.

### **Infrastructure and Capital Facilities**

The Cabezon Communities development area is surrounded by relatively high capacity transportation, water, and drainage facilities. Internally, with the exception of a large diameter water main on 19<sup>th</sup> Avenue, no significant infrastructure improvements exist. The redevelopment of this area will require design and construction of a network of roads, trails, water and sewer lines, sewer lift stations and a potential new wastewater treatment facility (included in the land use plan at the City's request), parks, and drainage facilities. The sizes and configuration of these facilities are generally shown in the water, sewer, and drainage sections of the Master Plan, and will be consistent with the 2020 ICP and previously approved City of Rio Rancho infrastructure plans and design standards.

### **Environmental Sustainability**

The 2020 ICP looks for general environmental sustainability on a community level, and Cabezon is uniquely situated to assist in the implementation of these important policies. Water will be dealt with sensitively from both a quality and quantity standpoint. Water quality enhancement facilities can be built at Cabezon, and recycled water will be used for landscape irrigation, where available, to conserve water to the maximum extent possible. Multi-modal transportation networks are established to promote bicycling and walking, and a mixed-use live/work/shop/play environment has been established to minimize vehicular trips and protect air quality. Multi-use of land, co-location of parks near neighborhoods, and the integration of a variety of housing types and prices throughout the community all provide opportunities for a more sustainable approach to community development than the typical suburban development styles of the past. Additionally, the developer at Cabezon has agreed to set aside up to 15 acres of land for a new state of the art wastewater treatment facility at the City's request. This will result in shorter utility line extensions and adequate facility capacity for this community and the rest of the City.

**Housing**

The Cabezon Master Plan implements all of the housing policies and actions from the 2020 ICP. These were addressed in detail in the Redevelopment Plan including: encouraging the development of a variety of high quality housing types and densities, and promoting housing construction in City infill development areas.

**Community Services and Public Facilities**

Since Cabezon is developing within a redevelopment infill area, many community services and public facilities already exist in the general vicinity of the project. Additional revenues for community services and public facilities will be provided by Cabezon development through gross receipts tax revenue, enterprise fund revenue, and impact fees (see the separately submitted Fiscal Analysis document for additional information on revenues for these facilities and services). Additionally, community facilities can be located within the community park at Cabezon if that is desired by the City in the future.

**Economic Development**

The commercial and medical areas designated at Cabezon (over 160 acres in area combined) will generate substantial revenues to the City of Rio Rancho and provide convenient opportunities for future employment for City residents. Two of the policies in the 2020 ICP relating to economic development encourage the streamlining of government processes and procedures to promote economic development, and the location of these areas in locations where utilities are already available or nearby. Successful redevelopment efforts at infill locations within the City through Redevelopment and Master Plans provide for implementation of these policies.

In summary, this Master Plan is consistent with the eight general principles of the 2020 ICP, as well as the policies and action statements of the Comprehensive Plan.

**Phasing Plan**

A generalized phasing plan follows this section. The purpose of the phasing plan is to provide an overview of where early phases of construction are anticipated to begin, based on proximity to existing infrastructure. Nothing in the phasing plan is intended to restrict development in any part of Cabezon from proceeding during any phase of the project. The phasing plan is only a generalized guideline of anticipated development sequencing, and is not a restriction on development anywhere within Cabezon.

## **2. DESIGN GUIDELINES**

### **A. INTRODUCTION**

The Cabezon Communities Master Plan recognizes the importance of creating design guidelines that promote a sense of cohesiveness within the entire community. The purpose of these design guidelines is to provide a flexible framework for community design intent with general goals that encourage innovative and creative solutions, rather than setting a rigid set of requirements that all site development plans must adhere to. The desired character of design features common to the community such as grading, landscape, signage, lighting, walls, and architecture are generally expressed in these guidelines. These guidelines will be included within the Cabezon Communities Master Plan adopted by the City of Rio Rancho for informational purposes, and will provide a framework for future development.

The Cabezon Communities Design Review Committee (CCDRC) will be formed for those properties north of Westside Boulevard, while a second design review committee (DRC) will be formed for those properties south of Westside Boulevard. The CCDRC and DRC, to be selected by the respective Owners, will evaluate how well each site development plan submitted for approval meets the additional restrictions in covenants (to be determined by the landowner subsequent to zoning).

Common areas within Cabezon Communities will be maintained through a Public Improvement District (PID) or through a neighborhood association. A PID functions like a tax increment financing district, whereby an incremental amount of taxes are assessed to properties within a given district for the purpose of financing public improvements within that district. The PID and/or neighborhood association will maintain all public streetscapes, entries, and internal neighborhood trails. It is anticipated that the City of Rio Rancho will maintain the regional trails along arroyos and the developed City parks within Cabezon.

This section of the guidelines is primarily intended as a generalized guide for end users that will participate in the development of Cabezon Communities. These guidelines do not supersede specific requirements under the Rio Rancho Zoning Code, and City staff are only required to enforce the existing zoning regulations. Any additional restrictions contained in covenants will be enforced by the CCDRC or DRC as set up by the developer.

The layout for Cabezon Communities provides excellent potential for creating a coordinated system of bikeways and pedestrian trails to serve the community with alternative modes of transportation. The system is designed to create a cohesive network that links various neighborhoods to community facilities, both active and passive, and enhances the recreational opportunities for residents. Cabezon Communities will be designed and oriented with an open space and trail network that encourages active and passive recreation. This open space and trail network is also supplemented with community parks of varying sizes. Recreational opportunities are enhanced by the bicycle and pedestrian orientation of Cabezon Communities. Drainage ways will be jointly used as recreational/trail facilities wherever possible.

## **B. RESIDENTIAL DESIGN GUIDELINES**

Each residential neighborhood may have a unique identity that will be established through tailored development standards, design guidelines, and signage parameters. This approach will enable Cabezon Communities to carve out its own identities and niches within the overall context of Rio Rancho thereby avoiding the generic, sterile, cookie cutter appearance found in subdivisions elsewhere. The CCDRC and DRC will review and approve architectural elements of all development in Cabezon Communities.

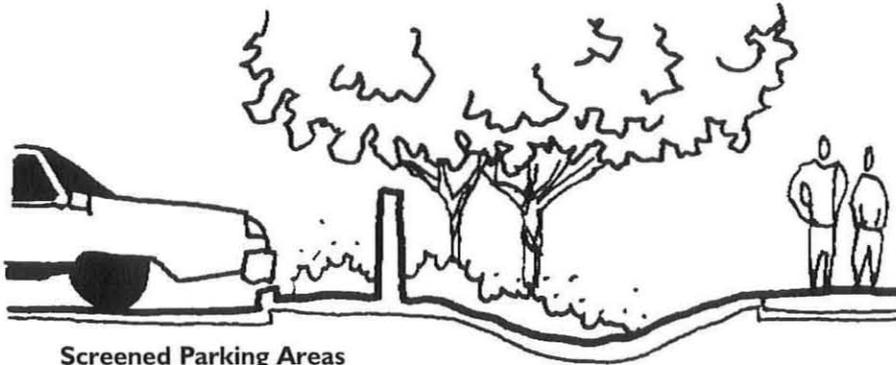
### **SITE PLANNING**

A primary focus in specific site design within Cabezon Communities will be the creation of a community that is pedestrian and bicycle oriented. All developments should provide convenient pedestrian circulation through and between parcels, and to parks and open space corridors. Safe, convenient and pleasant pedestrian circulation may be accomplished with walkways, bike paths, view-points, special pavings, shade, rest areas, and other pedestrian amenities.

The relationship of building to street contributes to how the environment is perceived and experienced and as such is an important design issue to consider in site planning for all types of land uses. Site plans for residential subdivisions should provide variety and visual interest in the streetscape. Pedestrian connections between neighborhoods should be planned for efficient pedestrian movement.

- Ø In general, long, straight roads are discouraged. The use of curvilinear streets, knuckles or cul-de-sacs is encouraged to provide variety and visual interest in the streetscape. These concepts also promote the creation of "neighborhoods within neighborhoods."
- Ø Fronting single family units on collector streets is discouraged.
- Ø Setbacks shall be as identified in the Rio Rancho Zoning Code, and if variations are needed, they must be sought from the City at the time of subdivision.
- Ø Uniform front yard setbacks in residential areas should be avoided. Varied setbacks add visual interest and avoid creating a tunnel effect.
- Ø Varying the placement and orientation of garages also helps to avoid the creation of a monotonous streetscape visually dominated by garage doors. The visual impact of garage doors may be minimized by placing them even with, or set back from, the house fronts, rather than projecting out from the house. Side-entry garages may be used for wide lots (including corner lots) or on narrow lots if the garage is extended in front of the home creating an ell shape. Rear garages with street or alley access are also encouraged.
- Ø Pedestrian openings at the end of cul-de-sacs or openings in perimeter walls are encouraged to allow pedestrian connections between subdivisions, commercial areas, and adjacent streets.

- Ø The design of vehicular circulation and parking areas within multi-family developments should provide for safe and convenient movement of vehicles, limit vehicular/pedestrian conflicts, limit paved areas, and soften their visual impact. Parking areas should be sufficient to serve the complex without utilizing adjacent streets.
- Ø In multi-family developments, parking areas should be screened from public streets by appropriate landscaping techniques, including earthen berming, and/or short masonry walls.



- Ø Bicycle parking should be provided in multi-family developments in a manner that provides convenient access to their use by each building.

## **SIGNAGE**

Signage should enhance the overall attractive character of the community, as well as provide information and direction to residents and visitors. Effective site signage functions not as a separate entity but as a coordinated element of its environment. A common design theme for signage within Cabezon Communities will enhance the community image. Size and placement of all signage should be considered an integral part of the site development process. Signs must conform to existing Rio Rancho regulations, and will be further restricted by private covenants and reviewed by the CCDRC and DRC.

## **LIGHTING**

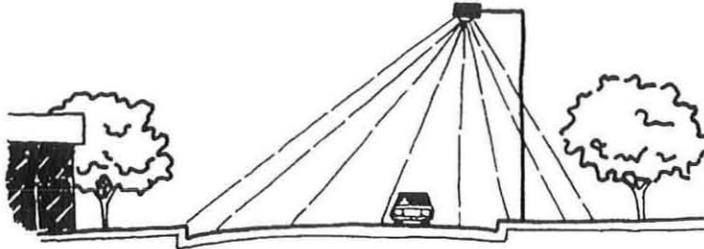
The objective of the lighting guidelines is to preserve the “dark sky” while providing lighting that enhances the safety, security, and visual aesthetics of the area. Careful attention to lighting detail will contribute to the sense of a cohesive community image. Lighting design and features will differ according to the land use. In all cases, light fixtures and standards shall conform to state and local safety illumination standards and existing City regulations. Additional restrictions on lighting will be imposed through privately enforced covenants, conditions and restrictions (CC&Rs).

- Ø Street Lighting
  - Lighting should be located to enhance the safety of pedestrian and vehicular flows at key points along roadways. Light should be concentrated at intersections and pedestrian crosswalks. The maximum height of street light fixtures shall be as required by the City of Rio Rancho.

- Excessive light spillage on adjacent properties should not be allowed. Light fixtures should be recessed or shielded.

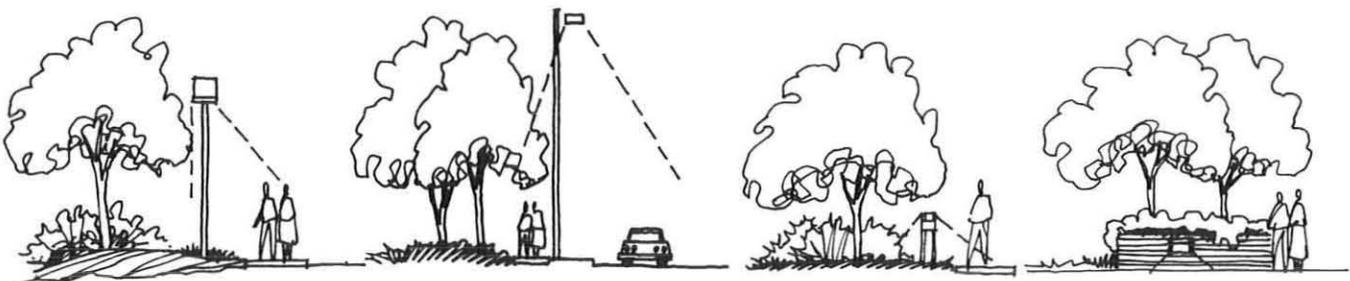
Ø Pedestrian Lighting

- Lighting should be pedestrian oriented in districts with high pedestrian movement, such as the commercial, medical, and community center areas. Bollard or wall pocket lighting is encouraged along community center sidewalks and other public areas. Light fixture heights will be regulated in the CC&Rs.



**Shielded Lighting**

- Bollard material and design should be compatible with the adjacent buildings. Shatter-proof coverings should be provided for bollards and other types of low-level lighting.
- Lighting may be used to accent certain landscape features. This type of lighting should be of a low-level intensity and only illuminate the intended landscape feature. Concealed lighting sources are recommended.
- Lighting for the trail system should be provided at an appropriate spacing to create a safe and secure environment.



**Pedestrian Oriented Lighting**

**SITE UTILITIES**

The purpose of these guidelines is to promote the coordinated development of utilities within Cabazon Communities and to minimize utility costs and visual impacts associated with utility structures.

- Ø Utility easements shall be provided as required.

- Ø All permanent utilities shall be located underground.
- Ø Transformers should be grouped with utility meters and screened from view where possible.

## **LANDSCAPE and STREETScape**

The key to creating a truly liveable and high quality environment will be the development of an overall landscape master plan. The environmental, as well as aesthetic, value of landscaping in an arid region cannot be overestimated. Landscaping should be used to frame views, as a buffer from noise or undesirable views, to break up large expanses of parking, to provide wind protection, shade, and relief from the heat and glare generated by development, to control soil erosion, and enhance pedestrian and vehicular traffic and safety.

Recognizing the increased public awareness of water conservation, this Plan promotes the use of native and naturalized plant species that perform well in an arid environment. Major arterials should be landscaped with native species and can serve as a demonstration project to the rest of the community. A Plant Palette and xeriscape principles of design will be included in the subsequent CC&Rs.

Special attention should be given to landscaping the major entries to Cabezon Communities. Plant materials should be used to highlight these key areas with the intent of reinforcing the community image.

### ***Residential Landscape***

- Ø Individual homebuilders will be required to provide front yard landscaping for each house through the developer's CC&Rs. The optional landscape plans will require approval by the CCDRC and DRC.
- Ø Accent materials, such as river cobble and/or boulders are encouraged.
- Ø Landscaping in accordance with an approved plan, by development phase for residential subdivision perimeter landscaping, must be installed in a timely manner in accordance with the CC&Rs.

### ***Common Landscape Areas***

- Ø Turf use limitations will be established within the CC&Rs.
- Ø If turf is to be used in non-pedestrian areas, it should be one or a combination of the drought tolerant grass species.
- Ø Undeveloped areas held in reserve for future building or pavement should be seeded with a mixture of native grasses/wildflowers.
- Ø Coverage of the common landscape areas with living vegetative material will be governed by existing City regulations and the future CC&Rs.

## **Streetscapes**

Streetscape design is another key factor in determining neighborhood quality and livability. Providing streetscape amenities such as landscaping and street trees, benches, bus shelters, bike racks, and trash receptacles will help create an attractive community for residents and visitors.

- Ø A consistent landscape theme in residential areas will reinforce community identity. Providing large canopied street trees in residential areas will soften the streetscape and provide the feeling of an established neighborhood as the trees reach maturity.
- Ø Street trees should be provided at certain intervals along major and minor roads as determined by the CC&Rs. Trees in medians and allowable species of trees will also be regulated through the privately enforced covenants.
- Ø In addition to the individual residential landscape requirements to be determined in the CC&Rs, a minimum of one street tree should be required per lot, to be provided by the Builder. Maintenance of these trees shall be the responsibility of the individual homeowner.
- Ø Street trees shall be planted in accordance with City setback and right-of-way regulations.
- Ø High water use turf should not be used within the street R.O.W. Low water use turf, such as Buffalo Grass or Blue Grama Grass, may be used in accordance with coverage requirements of the CC&Rs.
- Ø Automatic underground irrigation systems should be provided for all formalized landscaped areas, in accordance with the requirements of the CC&Rs.

## **ARCHITECTURAL STYLES**

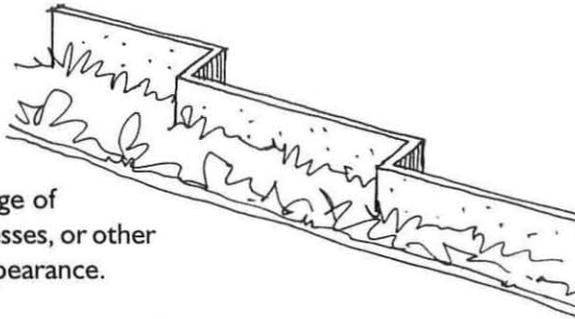
Architectural style is not enforced by the City in current regulations. The goal of having architectural guidelines is not to limit design creativity, but to provide the framework for high quality design. While architectural style should not be restricted, certain common elements should be complimentary to and enhance the community image. The architectural design should respond to climate, views, solar exposure, and aesthetic considerations. Building materials and colors, and other design elements will be included in the private covenants.

## **WALLS**

Walls and fences will serve to provide security, screening of unsightly areas, visual relief, and buffering between land uses. A consistent approach to wall design will provide an element of visual continuity in Cabezon Communities. Walls within the residential area should be considered an integral part of the site design.

- Ø The Developer intends to prepare a wall treatment plan that is to be used by all Builders for subdivision perimeter walls. The typical wall detail may be varied slightly in order to accommodate builder identity, however, variations must be approved by the CCDRC and DRC.

- Ø Wall design issues will not be enforced by the City beyond its standard height and setback regulations. Additional requirements will be enforced through the CC&Rs.
- Ø To soften the horizontal mass of a continuous wall, the wall may be set back from the adjacent sidewalk with the space left between the wall and sidewalk used for landscaping.
- Ø Long stretches of wall should be articulated to provide visual relief. This can be accomplished by staggering the wall, providing a change of materials, providing buttresses, or other techniques to vary the appearance.



## **MECHANICAL EQUIPMENT**

Mechanical equipment screening and siting considerations will be controlled through the subsequent CC&Rs.

## **B. NON-RESIDENTIAL DESIGN GUIDELINES**

These standards address the issues of landscape, setbacks, pedestrian amenities, screening, lighting, signage, and architecture that will create the visual image desired for the commercial and medical development within the Cabezon Master Plan. These standards address commercial, office, and medical projects.

### **TRACTS 13A, 14A-1, 14A-2, AND 18-A-1**

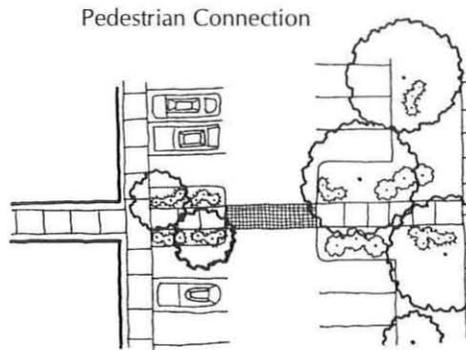
The following development standards apply to 13A, 14A-1, 14A-2, and 18-A-1 as shown in the Cabezon Master Plan.

#### **Pedestrian and Site Amenities**

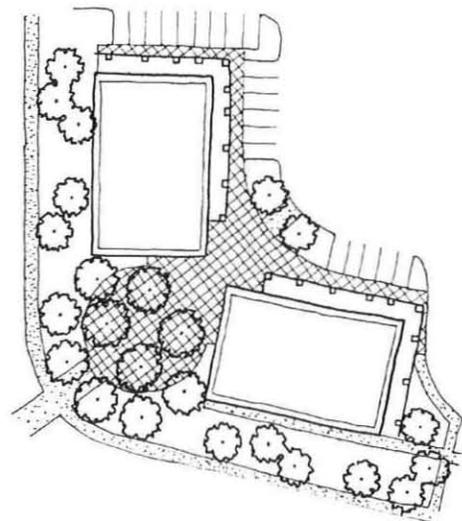
The creation of an attractive and functional commercial/medical environment will depend on creative site design and will be a primary design objective for the commercial/medical areas in Cabezon. Objectives to achieve this goal include maintaining a high quality and consistency in style for site amenities including benches, plazas, walkways, lighting, etc.; providing for attractive building design and massing; and creating separate vehicular and pedestrian circulation systems in order to support the creation of a user-friendly commercial/medical centers.

The use of alternative paving materials (brick, colored concrete, decomposed granite, etc.) for pedestrian pathways are encouraged. Public art is another site amenity that is strongly encouraged, and if proposed, should be part of the subsequent building plans. The following pedestrian features should be integrated into all site designs:

- Ø Pedestrian connections to buildings should be provided in parking lots with greater than 50 spaces and should connect to adjacent roadways, sidewalks, and pathways.



- Ø Pedestrian crossings shall be clearly demarcated with special paving treatment where they cross vehicular entrances and drive aisles and where City trails cross streets.
- Ø Freestanding restaurants, if proposed by subsequent Site Plans, shall provide outdoor patios and shall be shaded by trees and/or a shade structure that is architecturally integrated with building architecture.
- Ø Bicycle storage racks that are conveniently located near building entrances shall be provided. The minimum number of bicycle racks shall be determined by the number of parking spaces provided, consistent with the City Zoning Code.
- Ø Sidewalks will be consistent with City of Rio Rancho requirements, with additional landscape requirements, sidewalk widths enhancements, and locations as defined in the CC&Rs.
- Ø Open space, trails, and plazas within the non-residential areas are intended to be for both active and passive recreational uses, such as jogging, bicycling, picnics and similar activities, while potentially fulfilling additional functions for water quality and drainage.



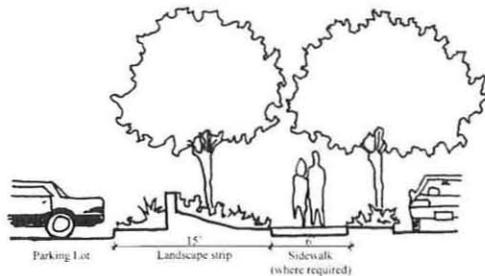
Commercial Plaza

### Parking

In order to support the goals for the property regarding pedestrian accessibility, careful attention should be paid to the parking design. An effort should be made by site designers to lessen the impact of parking facilities on the land. In order to lessen the visual impact of parking areas, parking facilities should be broken up into a series of smaller areas.

- Ø Handicapped parking spaces shall be provided adjacent to building entries.

- Ø The total minimum amount of parking provided shall meet parking requirements in the City Zoning Code.
- Ø Structures and on-site circulation systems should be located to minimize pedestrian/vehicle conflicts. Pedestrian access shall be provided to link structures to the public sidewalk.
- Ø Parking areas shall be designed to include a pedestrian link to buildings.
- Ø In cases where parking is adjacent to roadways, a combination of landscaping and low walls for screening purposes shall be required. All walls shall be architecturally compatible with surrounding buildings.



Parking Lot Screening

- Ø Cross-access easements will be provided between adjoining non-residential parcels within Cabezon.
- Ø To allow for an appropriately sized landscape buffer adjacent to roadways, parking areas shall be set back a minimum of 15 feet from the right-of-way, except along Unser Boulevard where the setback shall be a minimum of 25 feet.

### Landscape

The development of an overall landscape concept will establish a framework that unifies the property. The landscape design should emphasize native and naturalized plant species. All landscaped areas need to be coordinated and responsive to existing environmental conditions and local building policies. These standards are to be used as a supplement to City requirements.

- Ø A minimum of 10 percent of the gross lot area for non-residential development shall be devoted to landscape materials.
- Ø Landscaped areas shall be a minimum of 36 square feet and a minimum width of 6 feet. Living, vegetative materials shall cover a minimum of 75 percent of the landscaped areas. The area and percentage is calculated based on the mature canopy size of all plant materials.
- Ø All planting areas not covered with turf shall have a ground topping of river rock, shredded bark, gravel mulch, or similar material which extends completely under the plant material.

- Ø Appropriate landscape headers shall be used to separate any turf and groundcover areas.
- Ø To shade and mitigate the negative visual impact of large expanses of pavement, interior parking areas shall have one tree for each 10 parking spaces with no space being more than 100 feet from a tree.
- Ø 75 percent of the required parking area trees shall be deciduous and have a mature height and canopy of at least 25 feet.
- Ø An automatic underground irrigation system shall be provided to support all required landscaping. Irrigation components should be checked periodically to ensure maximum efficiency.
- Ø Minimum plant sizes at time of installation shall be as follows:
  - Trees: 3-inch caliper
  - Shrubs & Groundcovers: 5 gallon
  - Turf grasses shall provide complete ground coverage within 1 growing season after installation.

### **Screening/Walls and Fences**

The effective use of screening devices for parking lots, loading areas, refuse collection, and delivery/storage areas is essential to limit their adverse visual impact on the property. The site orientation of these elements shall be away from streets and pedestrian areas. The standards established in the landscape and setback sections will provide the primary means of screening unattractive elements and activities.

### **Screening**

The following screening is to limit adverse visual impacts caused by various uses and/or equipment that is common to non-residential properties. All such screening should be compatible with other structures on the property and should have some common architectural features found within the development, such as: colors, materials, and decorative features.

- Ø Parking areas shall be located away from adjacent streets and properties and shall be screened with plant materials, walls, or earthen berming. Such screening shall have a minimum height of 3 feet.
- Ø All outdoor refuse containers shall be screened within a minimum 6 foot tall enclosure which is large enough to contain all trash generated between collections. Trash enclosures shall be screened with plant materials.
- Ø The design and materials for refuse collection enclosures shall be compatible with the architectural theme and materials of the site and adjacent buildings.
- Ø No refuse collection areas shall be allowed between streets and building fronts.

- Ø All mechanical equipment shall be screened from adjacent public rights-of-way and properties. All mechanical equipment shall be screened from public view by materials of the same nature as the basic materials of the building.

### **Architecture**

The architectural design should demonstrate high quality aesthetic character throughout the property and should respond to climate, views, solar access, and aesthetic considerations.

Non-residential buildings will be a hybrid of New Mexico architectural styles, ranging from traditional to contemporary incorporating stucco surfaces, stacked stone wainscot and tower elements, precast concrete posts, lintels, cap stones, and ramadas and clay tile roof elements. Materials will be natural rather than synthetic, in warm colors ranging from light to dark tans, terracotta red to deep browns. Roof mounted mechanical equipment will be screened from view by parapets or mechanical screens. Ground-mounted equipment will be screened by building elements or landscaping. All sides of all buildings will be architecturally articulated with the elements described above.

- Ø All commercial buildings shall comply with City Zoning Code, except as provided for in this master plan, as well as other local building and fire codes.
- Ø Finished building materials shall be applied to all exterior sides of buildings and structures and shall be consistent on all sides. Any accessory buildings and enclosures, whether attached or detached from the main building, shall be of similar compatible design and materials.
- Ø No metal buildings are allowed.
- Ø No plastic or vinyl building panels, awnings, or canopies are allowed. Awnings and canopies, if used, shall be integrated with building architecture.
- Ø Building massing and height should work together to avoid monolithic frontages. Varying heights combined with open corridors should be used to achieve this objective.
- Ø Entryways to non-residential buildings shall be clearly defined.

### **Lighting**

In order to enhance the safety, security, and visual aesthetics, careful consideration must be given to both the daytime and night-time appearance of the lighting design and fixtures. The primary design objective of the site lighting system shall be to maximize public safety while not affecting adjacent properties, buildings, or roadways with unnecessary glare or reflection.

In order to accomplish the lighting goals, the following guidelines shall be required for the design of the lighting system:

- Ø All lighting shall comply with the City Zoning Code. Placement of fixtures and standards shall conform to state and local safety and illumination standards.
- Ø All lights shall be shielded source with glare cut off angles of a maximum of 75 degrees to prevent spillage onto adjoining properties or light pollution of the existing "dark sky". Cobra and sodium lights are prohibited.
- Ø The height of street lighting and parking area lights shall be kept to a minimum necessary to meet safety requirements.
- Ø Individual site lighting standards shall blend with the architectural character of the buildings and other site fixtures.
- Ø The location of light fixtures shall be identified on subsequent site plans. The maximum mounting height of luminaries for pedestrian scale lights shall be 20 feet in height. The maximum mounting height of luminaries for parking lot lights shall be a maximum of 30 feet in height, except where they are within 70 feet of residential, they shall be 20 feet in height.
- Ø Site lighting shall be restricted to a maximum off-site luminance of 1,000 lamberts from any point and 200 foot lamberts from any residential property line.
- Ø Accent lighting is permitted, however, surface lighting is limited to an average of 2 foot-candles measured 4 feet from the surface level of any point on the building surface being lighted.
- Ø Average light level shall be limited to 2 foot-candles with maximum levels limited to 16 foot-candles as measured from 4 feet above the surface level of any point on the site.

### **Signage**

The following signage standards will regulate the size, location, type, and quality of sign elements within Cabezon. The goal is to provide a signage program that is of high quality, maintains a consistent style, creates a sense of arrival, and complements the visual character of the property.

- Ø All signs, including quantity, shall be in compliance with City Sign Ordinance
- Ø Entry signs shall be monument type and shall complement the materials, color, and architectural character of the buildings.
- Ø Free-standing signs shall be designed that do not require any external bracing, angle-iron, guy wires or similar devices.
- Ø No signage is allowed that uses moving parts, makes audible sounds, or has blinking or flashing lights.

- Ø Signs shall not overhang into the public right-of-way or extend above the building roof line.
- Ø Off-premise signs (billboards) and portable signs are prohibited.
- Ø Building mounted signs shall:
  - Identify the name and business of the occupant or of those offering the premise for sale or lease;
  - Not have too many different colors;
  - Have a significant contrast between the background and the text in order to ensure readability; and
  - Not intrude upon any architectural features, including windows, columns, mouldings, or other decorative features.
- Ø No illuminated plastic panel signs are allowed except business logos.
- Ø Signs on buildings shall not be illuminated where light from the sign will impact adjacent residential or natural areas.

### **Utilities**

To ensure the overall aesthetic quality of the property and the natural environment, the visual impact of utilities and equipment should be minimized by the following:

- Ø All new electric distribution lines shall be placed underground.
- Ø Transformers, utility pads, and telephone boxes shall be appropriately screened with walls and/or vegetation when viewed from the public right-of-way.
- Ø When an above-ground backflow prevention device is required by the City of Rio Rancho, the enclosure shall be constructed of materials compatible with the architectural materials used as the main elements of the building. If pre-fabricated fiberglass enclosures are used, they shall be appropriately screened from view by walls and/or landscaping.

### **COMMERCIAL TRACTS 10B, 11, 12, AND 15B**

The following development standards apply to Commercial Tracts 10B, 11, 12, and 15B as shown in the Cabezon Master Plan.

### **STREETSCAPE**

The development of a bold and dynamic entry and streetscape is desirable in defining an image for Cabezon Communities. The streetscape will provide a unifying element that weaves its way through, and ties together the vast development potential of the project. Specific streetscape requirements will meet City minimums, and may require additional regulations as set forth in the CC&Rs.

## **PARKING**

The intent of the standards for the development of parking areas is to: mitigate heat/glare through the provision of landscaping; minimize the visual impact of parking areas; and provide accessible, safe circulation within and adjacent to the parking areas.

- Ø Parking space standards shall be per the City of Rio Rancho Zoning Code.
- Ø Large parking areas should be broken into smaller parking areas. The preferred method is to provide landscaped medians with pedestrian connections, and these standards will be enforced through the CC&Rs.
- Ø ADA-compliant parking shall be located adjacent to main building entries as required by existing regulations.
- Ø Clear pedestrian connections should be provided through parking areas. Shade trees should be provided along pedestrian walks.
- Ø Parking lot landscaping is required by the City, and may be regulated in additional detail by the CC&Rs.

## **BICYCLE FACILITIES**

Providing convenient bicycle facilities to encourage non-vehicular travel within Cabezon Communities will be encouraged in support of the Plan's goal of supporting alternative modes of transportation.

## **SITE LANDSCAPE**

The landscape environment serves to enhance the visual dynamic of the development and aid in reinforcing the street edge and pedestrian environment. Landscape elements, such as street furniture, lighting, bollards, and graphic pylons should be used to reinforce the street edge. A clear theme and image for Cabezon Communities will be established through the use of these materials, as well as consistent paving materials, plantings, signage, etc. These site landscape requirements will meet all the regulations of the City, and will be addressed in additional detail in the CC&Rs. Consideration will be given to spacing and sizing of plant materials, coverage of site area, water conservation, and other site landscape issues.

## **SITE PLANNING**

The intent of the site planning guidelines is to create pedestrian-friendly environments for employees and visitors.

- Ø Cross access easements should be provided between adjoining parcels.
- Ø An outdoor patio space with shade trees and/or shade structure is encouraged and may be required in the CC&Rs.

- Ø Sidewalk requirements will be consistent with those used by the City of Rio Rancho, with additional landscape requirements, sidewalk width enhancements, and locations as defined in the CC&Rs.
- Ø Pedestrian connections should be provided from each building to the internal circulation system and to adjacent roadways. Shade trees should be provided along the pedestrian connection.
- Ø Design, paving materials, trail design, and requirements for landscape or shade provision may be required through private covenants.

### **OPEN SPACE AND PARKS**

The open space and park areas within Cabezon Communities are intended to be for both active and passive recreational uses, such as jogging, bicycling, picnicking, playground and ballfield use, etc., while also fulfilling their additional function for water quality and drainage. The design of these areas is undefined until after zoning has been established and the facilities are ready to be designed.

### **SETBACKS**

The use of building and parking area setbacks is encouraged to provide space for the creation of visually attractive streetscapes within Cabezon Communities. Required within these setbacks will be pedestrian walkways, screening devices, and landscape improvements, as defined in future CC&Rs. Setbacks will be consistent with those listed in the City's Zoning Ordinance, unless a variance or amendment has been requested at the time of site development. The CC&Rs may require more stringent regulations, but all sites must meet City setback regulations.

### **LIGHTING**

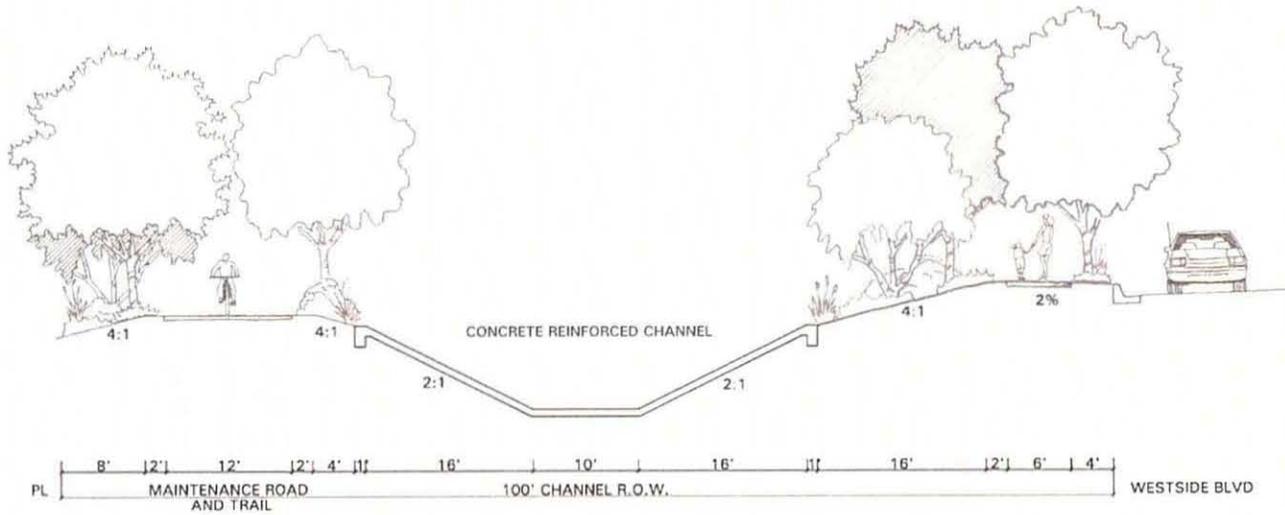
A consistent theme for the lighting fixtures within the streetscape and common areas of Cabezon Communities will contribute significantly to the overall aesthetic character. Safety and security should be the primary design consideration, as well as the daytime appearance of the light fixtures. Lighting will be regulated in the subsequent CC&Rs.

### **SCREENING/BUFFERING**

Mechanical equipment and refuse enclosures, whether on roof areas or at street level, should be fully screened from pedestrians or motorists. Screening should be compatible with materials and design of the building and will be enforced through CC&Rs

### **SIGNAGE**

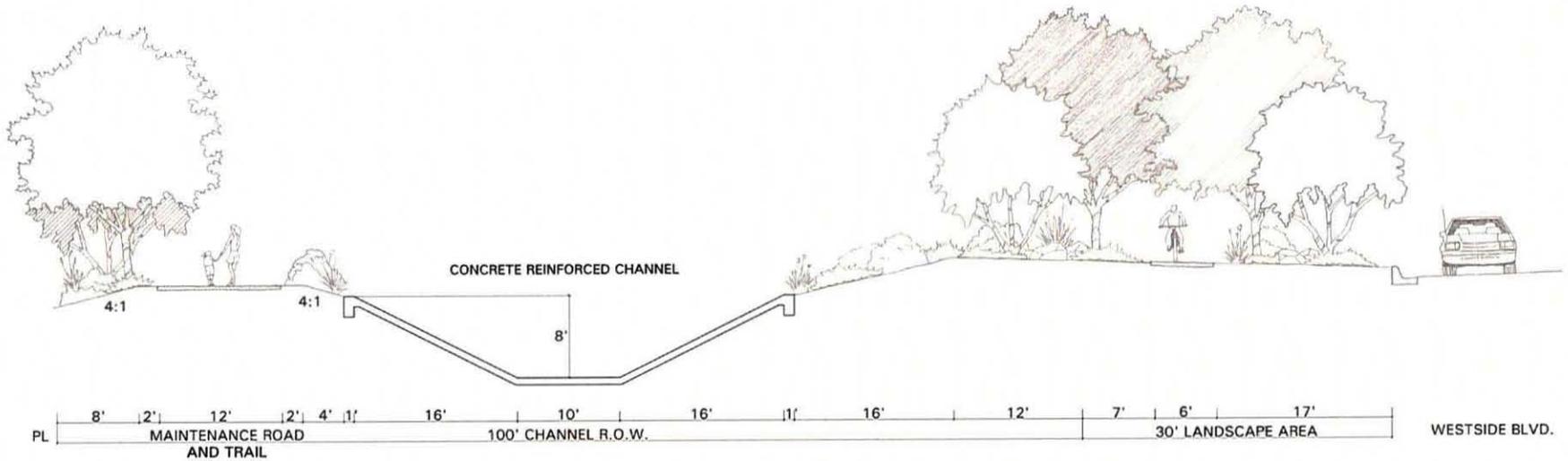
Signage criteria will create a sense of arrival to the development and establish a quality visual impact. Signage will meet requirements of the City codes, and may also be required to comply with additional requirements as set forth in CC&Rs.



CABEZON TRACTS 13 AND 14  
PROTOTYPICAL CHANNEL AND TRAIL SECTION  
100' SECTION

NOTE: DISTANCES AND SLOPES MAY VARY.





CABEZON TRACTS 13 AND 14  
PROTOTYPICAL CHANNEL AND TRAIL SECTION  
130' SECTION

NOTE: DISTANCES AND SLOPES MAY VARY.



## INTRODUCTION

The Cabezon Development is located in Unit 16 West in the City of Rio Rancho (Figure 1, Section 1). The goal of this Water System Master Plan is to assure that the entire 912 acre mixed-use development can be served with potable water for commercial and domestic use, and for fire protection. This plan details the existing facilities available for water supply and delivery and outlines the system expansion requirements necessary to provide water service.

## EXISTING CONDITIONS

The Cabezon development is a rectangular shaped area bounded on the west by Unser Blvd., the south by the Sandoval County line, the east by Golf Course Rd. and roughly Southern Blvd. on the north (Figure 2, Section 1). The project area is located within two pressure zones. The upper two thirds of the Cabezon development is located within Pressure Zone 2 (HGL = 5410 ft). The lower one third of the development area is located within Pressure Zone 1 (HGL = 5280 ft). Ideally service for a lower zone is supplied from a reservoir in an adjacent upper zone. For Cabezon, these ideal conditions would consist of a Zone 3 supply feeding the water lines in Zone 2 and a Zone 2 supply feeding the Zone 1 water lines. However, Zone 3 does not have a reservoir in the general vicinity of Cabezon. Thus, service to Zone 2 comes from Zone 4 (Well 6A/Reservoirs 6 and 6A), and Zone 5 (Well 7 connected to Reservoirs 6 & 6A). Existing water supply reservoirs and wells in the vicinity are shown on Figure 3.

Water supply lines currently operating in the area include the following, described based on their street location (Figure 3).

### Southern Blvd

- 12-inch line from Unser Blvd. east to 27<sup>th</sup> St.
- At 27<sup>th</sup> St., the 12-inch line increases in size to 14-inch and continues east to NM 528.
- Various 6-inch and 8-inch lines extend from Southern Blvd. into Unit 16 West at all platted street intersections.
- An 8-inch line extends south along 27<sup>th</sup> St. to Martin Luther King, Jr. Elementary School located in Tract TR-A-1.

Unser Blvd.:

- An 8-inch line extends south along Unser Blvd. to the middle of existing Block F of Unit 16 West.

Golf Course Rd.

- From the intersection of Southern Blvd. and Golf Course Road, an 8-inch waterline extends south along Golf Course Road to Ann Circle. Between Ann Circle and 16<sup>th</sup> Avenue the line is 6 inches in diameter. At 16<sup>th</sup> Avenue the 6-inch line increases in size back to 8 inches and extends to 18<sup>th</sup> Avenue. The 8-inch line is connected to the existing 14-inch waterline in Southern Blvd. but a closed valve leading to the 8-inch line prevents direct service from the 14-inch line. The system pressure on the 14-inch line side of the connection is approximately 108 psi. Service to the 8-inch line comes via a pressure reducing valve station near Sara Rd. and Gay Circle. Construction plans are currently in preparation for the construction of a pressure reducing valve station at Southern Blvd. and Golf Course Road to allow service directly from the 14-inch line. The 8-inch line provides service through various 6-inch and 8-inch lines to the Unit 16 West area at 11<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> Avenues.
- A 16-inch line exits Reservoir 3 and proceeds south along Golf Course Road. In the vicinity of Ann Circle, the 16-inch line is reduced in size to a 14-inch waterline. In the vicinity of 21<sup>st</sup> Avenue, the 14-inch line is reduced in size to 10 inches. The 10-inch line proceeds south to a connection with New Mexico Utilities meter immediately south of Westside Blvd. This series of waterlines provides service to the Pressure Zone 1 service area between Golf Course Road and NM 528 beginning at 16<sup>th</sup> Avenue.
- At 19<sup>th</sup> Avenue, the 14-inch line connects to a 24-inch line. The 14-inch line reduces in size to 10-inch and proceeds south to Westside Blvd. where it connects to a New Mexico Utilities meter. Service is provided east towards NM 528.

19<sup>th</sup> Ave.

- A 20-inch line extends east along 19<sup>th</sup> Avenue from the Reservoir 17 site. At the intersection of 19<sup>th</sup> Avenue and 19<sup>th</sup> Street, a 16-inch waterline, from Well No. 17, connects to the 20-inch line. The 20-inch line extends west to east along 19<sup>th</sup> Avenue through Unit 16 until it reaches 29<sup>th</sup> Street. At 29<sup>th</sup> Street, the 20-inch line increases to 24 inches and splits in two directions; first continuing east connecting to the existing 14-inch waterline in Golf Course Road, and second continuing south along 29<sup>th</sup> Street to a point coincident with the natural extension of 23<sup>rd</sup> Avenue where the line turns east and continues along 23<sup>rd</sup> Avenue providing service ultimately to Intel.
- At Golf Course Road, an 8-inch waterline connected to the existing 14-inch waterline, extends west along 19<sup>th</sup> Avenue providing service to 28<sup>th</sup> Street and 29<sup>th</sup> Street via 8-inch stub-outs.

Westside Blvd.

- No existing service extends west along Westside Blvd. to the Cabezon area.

**PROPOSED CONDITIONS**

To determine system expansion requirements the following criteria were used to quantify water demand:

- Residential water use in Rio Rancho is 300 gpd/DU with a 2.167 peaking factor (per standard sewer availability review guidelines).
- Commercial water use is 1,750 gpd/acre with a peaking factor of 2.167 (per standard sewer availability review guidelines).
- Peak day demand plus 1,500 gpm for fire flow for residential uses.
- Peak day demand plus 3-hour 3,000 gpm fire flow for commercial uses.
- Required minimum static system pressure of 50 psi.
- A minimum of 40 psi system pressure under peak day demand.
- The most restrictive condition considered is maintaining 20 psi minimum system pressure under peak day demand plus fire flow of 1,500 gpm.

- Storage impacts are based on 200 gal/DU residential demand plus 1/3 peak demand commercial and 3,000 gpm for 3 hour fire flow.

Table 1 summarizes projected water demand and storage requirements for the development assuming the following baseline development conditions:

- 3,500 single family dwelling units
- 750 multi-family units
- 70.80 acres of commercial development
- 65 equivalent single family dwelling units associated with public-use lands

Average daily water demand for Cabezon based on these conditions is estimated to be approximately 1.42 MGD. Peak water demand for Cabezon is estimated to be 3.05 MGD. Baseline storage requirements for Cabezon, including a 3-hour fire flow at 3,000 GPM are estimated to be 1.50 MG.

Table 2 summarizes anticipated water demand for the Cabezon development, based on current projected land uses. Average daily water demand for Cabezon is estimated to be approximately 1.51 MGD. Peak daily water demand for Cabezon is estimated to be 3.25 MGD. Storage requirements, including a 3-hour fire flow at 3,00 GPM, are estimated to be 1.55 MG.

Results from Table 2 were used as the input conditions for iterations of the City's water model (H<sub>2</sub>O<sub>Net</sub>) for proposed build-out. The H<sub>2</sub>O<sub>Net</sub> system model was used to identify any potential well capacity, storage, and pressure problems that would be caused by the proposed development. The primary scenarios evaluated included: average day demand without fire flow; peak day demand without fire flow; and, peak day demand with fire flow. Residential and commercial demands were used, as appropriate, based on the current configuration of the proposed Cabezon development. When evaluating the various demand scenarios, the H<sub>2</sub>O<sub>Net</sub> program notifies the program operator if a deficiency has been recognized for any of the three items identified above. At no time during the course of these evaluations did the program identify a well capacity, storage, or pressure deficiency based on the proposed system layout.

In addition to providing an evaluation of the overall affect the proposed Cabezon development would have on system infrastructure, the City Department of Utilities asked

if an analysis of a specific condition could be evaluated relating to Intel. In response to this request, the impact on Intel caused by the combination of a fully-developed peak day demand and a three-hour fire flow, with a fire demand of 3,000 GPM, was evaluated. Under these conditions, the pressure at NM 528 and Westside Blvd. was 76 psi. The pressure at NM 528 and 19<sup>th</sup> Avenue was 69 psi. The pressure at NM 528 and 16<sup>th</sup> Avenue was 76 psi. These pressures exceed minimum standards required by the City.

Figure 4 shows the proposed water system infrastructure to supply the development area. This water main configuration was used to analyze the water demand with peak day and fire flow demands applied at critical nodes to determine availability. Overall, the model shows that existing infrastructure supplying water to the area is suitable for extension into this planned development. Modeled water pressures are also shown on Figure 4 where no node is shown to fall below minimum system requirements to supply water and support fire flow requirements.

### **System Expansion Phasing Plan**

Growth within the Cabezon master plan area will be driven by market demand. However, specific water system infrastructure construction has been proposed to occur in a step-wise fashion based on a conceptual plan provided by Curb, Inc. In response to the anticipated development scenario, the following phased construction program details the system facilities expected over time.

#### **Phase 1**

Phase 1 improvements will serve all of Areas 3, 4, 11, and 17 and 25% of Area 7, as shown in Figure 4.

- 12-inch waterline in Unser Blvd. from Southern Blvd. to Cabezon Blvd.
- 12-inch waterline from Unser Blvd. east on Cabezon Blvd. to 23<sup>rd</sup> St.
- 10-inch waterline in Cabezon Blvd. from 23<sup>rd</sup> Street to collector between Cabezon Blvd. and Westside Blvd.
- 10-inch waterline from Southern Blvd. south along 23<sup>rd</sup> St. to Cabezon Blvd.
- PRV to reduce pressure prior to entering 23<sup>rd</sup> Street from Southern Blvd. located in Western Hills on the north side of Southern Blvd

**Table 1  
Water Demand Projections for Baseline Development Assumptions  
Cabezon Water System Master Plan**

		Water Demand		
		Average Daily Demand GPD	Peak Daily Demand GPD	Storage Requirement Gallons
<i>Use Category</i>				
Baseline Residential Dwelling Units	3,500	1,050,000	2,275,350	700,000
Baseline Mixed Use Dwelling Units	750	225,000	487,575	150,000
Baseline Commercial Development	70.8 Acres	123,900	268,491	89,491
Baseline Public Use Equivalent Dwelling Units	65	19,500	19,500	13,000
<b>Totals</b>		<b>1,418,400</b>	<b>3,050,916</b>	<b>1,492,491</b>
Water Demand Criteria		Water Storage Criteria		
Use Category	Average Daily Flow	Peak Factor	Use Category	Amount
Residential	300 gpd per DU	2.167	Residential	200 gallons/DU
Commercial	1,750 gallons per acre C1	2.167	Commercial	1,264 gallons/acre
School (With Cafeteria, but no gymnasiums or showers) (1)	24 gpd per person 500 person occupancy 40 Equivalent Residential DUs	0	School (With Cafeteria, but no gymnasiums or showers) (1)	200 gallons/DU
Community Center (Assume similar to school) (1)	24 gpd per person 250 person occupancy 20 Equivalent Residential DUs	0	Community Center (Assume similar to school) (1)	200 gallons/acre
Park (1)	6 gpd per person 250 person occupancy 5 Equivalent Residential DUs	0	Park (1)	200 gallons/acre

(1) Taken from Texas Commission on Environmental Quality, Chapter 290, *Public Drinking Water*

(2) Additional storage due to 3-hour fire flow at 3,000 gpm is **540,000** gallons.

**Table 2  
Water Demand Projections By Development Area and Land-Use Type  
Cabezon Water System Master Plan**

Development Area ID	Proposed Zoning	Component Size of Developed Area Acres	Developed Units DUs	Developed Density DUs/Acre	Equivalent Design DUs	Commercial Development Acres	Water Demand		Storage Required (2) Gallons
							Average Day Demand GPD	Peak Day Demand GPD	
1	R1	71.50	215	3.00	215	-	64,500	139,772	43,000
2	R1	21.20	63	2.99	63	-	18,900	40,956	12,600
3	R4	80.80	485	6.00	485	-	145,500	315,299	97,000
4	R4	69.20	415	6.00	415	-	124,500	269,792	83,000
5	R4	51.30	369	7.18	368	-	110,400	239,237	73,600
6	R4	61.30	308	5.03	308	-	92,400	200,231	61,600
7	R4	98.90	593	6.00	593	-	177,900	385,509	118,600
8	R4	19.00	114	6.00	114	-	34,200	74,111	22,800
9	R4	28.70	172	6.00	172	-	51,600	111,817	34,400
10	R4	83.10	498	6.00	498	-	149,400	323,750	99,600
11	C1	10.00	-	-	-	10.00	17,500	37,923	12,640
12	C1	10.30	-	-	-	10.30	18,025	39,060	13,019
13	C1	50.50	-	-	-	50.50	88,375	191,509	63,832
14	Mixed	58.20	873	15.00	1,048	-	314,400	681,305	209,600
15	Mixed	14.70	176	12.00	265	-	79,500	172,277	53,000
16	School	19.80	-	-	40	-	12,000	12,000	8,000
17	Cm. Ctr.	15	-	-	20	-	6,000	6,000	4,000
18	Park	5	-	-	5	-	1,500	1,500	1,000
19	Park	5	-	-	5	-	1,500	1,500	1,000
20	Park	5	-	-	5	-	1,500	1,500	1,000
21	WWTF	15	-	-	-	-	-	-	-
<i>3-hour Fire Flow @ 3,000 gpm</i>									<i>540,000</i>
<b>Totals</b>		<b>793.50</b>	<b>4,281</b>	<b>-</b>	<b>4,619</b>	<b>70.80</b>	<b>1,509,600</b>	<b>3,245,046</b>	<b>1,553,291</b>
Water Demand Criteria					Water Storage Criteria				
Use Category	Average Daily Flow			Peak Factor	Use Category	Amount			
Residential	300 gpd per DU			2.167	Residential	200 gallons/DU			
Commercial	1,750 gallons per acre C1			2.167	Commercial	1,264 gallons/acre			
School (With Cafeteria, but no gymnasiums or showers) (1)	24 gpd per person 500 person occupancy 40 Equivalent Residential DUs			0	School (With Cafeteria, but no gymnasiums or showers) (1)	200 gallons/DU			
Community Center (Assume similar to school) (1)	24 gpd per person 250 person occupancy 20 Equivalent Residential DUs			0	Community Center (Assume similar to school) (1)	200 gallons/acre			
Park (1)	6 gpd per person 250 person occupancy 5 Equivalent Residential DUs			0	Park (1)	200 gallons/acre			

(1) Taken from Texas Commission on Environmental Quality, Chapter 290, *Public Drinking Water*

(2) Additional storage due to 3-hour fire flow at 3,000 gpm is 540,000 gallons.

**Table 3  
Wastewater Flow Projections By Development Area and Land-Use Type  
Cabezon Wastewater System Master Plan**

Development Area ID	Proposed Zoning	Component Size of Developed Area Acres	Developed Units DUs	Developed Density DUs/Acre	Equivalent Design DUs	Commercial Development Acres	Wastewater Generation	
							Average Day Demand GPD	Peak Day Demand GPD
1	R1	71.50	215	3.00	215	-	45,150	135,450
2	R1	21.20	63	2.99	63	-	13,230	39,690
3	R4	80.80	485	6.00	485	-	101,850	305,550
4	R4	69.20	415	6.00	415	-	87,150	261,450
5	R4	51.30	369	7.18	368	-	77,280	231,840
6	R4	61.30	308	5.03	308	-	64,680	194,040
7	R4	98.90	593	6.00	593	-	124,530	373,590
8	R4	19.00	114	6.00	114	-	23,940	71,820
9	R4	28.70	172	6.00	172	-	36,120	108,360
10	R4	83.10	498	6.00	498	-	104,580	313,740
11	C1	10.00	-	-	-	10.00	12,300	36,900
12	C1	10.30	-	-	-	10.30	12,669	38,007
13	C1	50.50	-	-	-	50.50	62,115	186,345
14	Mixed	58.20	873	15.00	1,048	-	220,080	660,240
15	Mixed	14.70	176	12.00	265	-	55,650	166,950
16	School	19.80	-	-	36	-	7,500	7,500
17	Cm. Ctr.	15	-	-	18	-	3,750	3,750
18	Park	5	-	-	6	-	1,250	1,250
19	Park	5	-	-	6	-	1,250	1,250
20	Park	5	-	-	6	-	1,250	1,250
21	WWTF	15	-	-	-	-	-	-
Sub-Total for Cabezon Only							1,056,324	3,138,972
City Flow From Lift Station No. 2 (2)							1,400,000	2,170,700
City Flow From Wastewater Treatment Plant No. 1 (2)							700,000	980,000
Sub-Total for City of Rio Rancho Only							2,100,000	3,150,700
<b>Totals</b>		<b>793.50</b>	<b>4,281</b>	<b>-</b>	<b>4,615</b>	<b>70.80</b>	<b>3,156,324</b>	<b>6,289,672</b>

Wastewater Generation Criteria		
Use Category	Average Daily Generation	Peak Factor
Residential	210 gpd per DU	3.00
Commercial	1,230 gallons per acre C1	3.00
School (With Cafeteria, but no gymnasiums or showers) (1)	15 gpd per person 500 person occupancy 36 Equivalent Residential DUs	0
Community Center (Assume similar to school) (1)	15 gpd per person 250 person occupancy 18 Equivalent Residential DUs	0
Park (1)	5 gpd per person 250 person occupancy 6 Equivalent Residential DUs	0

(1) Taken from Texas Commission on Environmental Quality, Chapter 317, *Design Criteria for Sewerage Systems*

NORTHERN BLVD.

RESERVOIR NO. 8  
OVERFLOW = 5857.0  
CAPACITY = 6.0 MG  
WELL NO. 8  
CAPACITY = 900 GPM

WELL NO. 7  
CAPACITY = 550 GPM

NORTHERN BLVD.

RESERVOIR NO. 10  
OVERFLOW = 5526.0  
CAPACITY = 3.0 MG  
WELL NO. 10  
CAPACITY = 1,800 GPM

NM 528

RAINBOW BLVD.

WELL NO. 19  
CAPACITY = 1,500 GPM

IDALIA RD.

RESERVOIR NO. 6 & 6A  
OVERFLOW = 5632.3  
CAPACITY = 5.1 MG  
WELL NO. 6A  
CAPACITY = 1,380 GPM

UNSER BLVD.

RESERVOIR NO. 4  
OUT-OF-SERVICE  
CAPACITY = 0.22 MG  
WELL NO. 4  
CAPACITY = 1,400 GPM  
OUT-OF-SERVICE

RESERVOIR NO. 3  
OVERFLOW = 5399.1  
CAPACITY = 1.0 MG  
WELL NO. 3  
CAPACITY = 620 GPM

SOUTHERN BLVD.

12" WL

12" WL

14" WL

14" WL

SOUTHERN BLVD.

RAINBOW BLVD.

UNIT 10

WELL NO. 17  
CAPACITY = 3,000 GPM

UNSER BLVD.

CABEZON

UNIT 16 EAST

16TH AVE.  
WELL NO. 2  
CAPACITY = 510 GPM  
WELL NO. 1  
CAPACITY = 85 GPM  
19TH AVE.

RESERVOIR NO. 17  
OVERFLOW = 5400.0  
CAPACITY = 1.0 MG

24" WL  
19TH AVE.

24" WL

24" WL  
23RD AVE.

WESTSIDE BLVD.

3000 0 1500 3000 6000

GRAPHIC SCALE (IN FEET) 1" = 3000 ft.



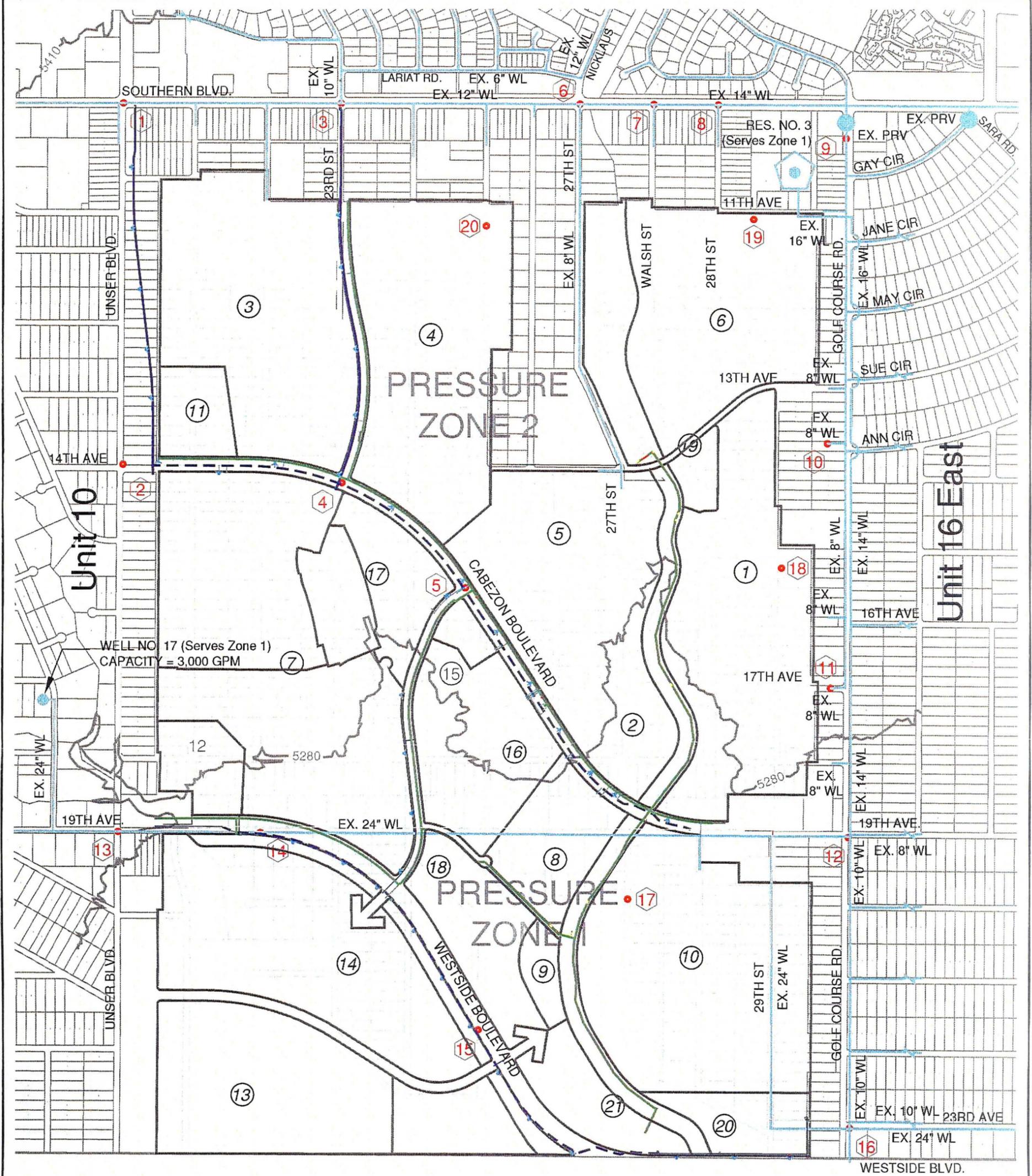
CITY OF RIO RANCHO



**WILSON & COMPANY**  
2800 THE AMERICAN ROAD S.E.  
SUITE 100  
RIO RANCHO, NEW MEXICO  
87124  
(505) 898-8021

CABEZON  
WATER MASTER PLAN

FIGURE 3  
EXISTING WATER INFRASTRUCTURE

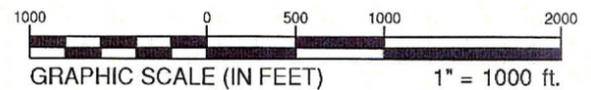


**LEGEND**

- 4 ● WATER MODEL PRESSURE NODE LOCATION/ID
- 2 PROPOSED WATERLINE ID
- 8 CABEZON DEVELOPMENT AREA ID
- EXISTING WATER INFRASTRUCTURE
- RE-USE LINE
- PROPOSED PHASE 1 WATER IMPROVEMENTS
- PROPOSED PHASE 2 WATER IMPROVEMENTS
- 5280 — ELEV. 5280 (HGL FOR PRESSURE ZONE 1)
- 5410 — ELEV. 5410 (HGL FOR PRESSURE ZONE 2)

WATER SYSTEM PRESSURE SUMMARY  
MAXIMUM DAY DEMAND WITH FIRE FLOW

PRESSURE NODE	PRESSURE (PSI)	PRESSURE NODE	PRESSURE (PSI)
1	40.4	11	91.0
2	65.6	12	60.7
3	51.2	13	47.6
4	78.5	14	54.4
5	78.0	15	84.0
6	60.0	16	83.2
7	53.5	17	60.7
8	47.9	18	70.0
9	60.0	19	53.5
10	65.2	20	58.8





**CITY OF RIO RANCHO**



**CITY OF RIO RANCHO**

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**CABEZON  
WATER MASTER PLAN**

**FIGURE 4  
PROPOSED WATER SYSTEM**

## INTRODUCTION

The Cabezon Development is located in Unit 16 West in the City of Rio Rancho (Figure 1, Section 1). The goal of this Wastewater System Master Plan is to assure that wastewater can be collected and treated from within the entire Cabezon 912-acre mixed-use development (Figure 2, Section 1). Planned uses include residential, commercial, mixed uses, a school, several parks and a wastewater treatment plant. This plan details the existing facilities available for wastewater collection and outlines the system expansion requirements necessary to collect and treat wastewater flows due to this development.

## EXISTING CONDITIONS

The City of Rio Rancho lacks wastewater infrastructure south of Southern Blvd. in the Cabezon Master Plan area. Unit 16 East, Cabezon, and Unit 10 are all unsewered (Figure 3). The City's existing wastewater collection system in the project vicinity drains generally from north to south and west to east, to and along Southern Blvd. Flows emanating from the north generally flow south by gravity. However, due to the undulating terrain in the area, the west to east flow is assisted by several lift stations. Five lift stations along the Southern Blvd. corridor are required to deliver collected wastewater to the northwest corner of Southern Blvd. and NM 528. At this point, the collected wastewater is diverted, by means of a control manhole, either to Lift Station No. 10 and on to Wastewater Treatment Plant No. 2 (WWTP 2) or to an existing 24-inch gravity collector on the east side of NM 528 and on to Wastewater Treatment Plant No. 1 (WWTP 1). At present, according to City Department of Utilities staff, approximately 95 percent of the collected wastewater is diverted through Lift Station No. 10 to WWTP 2.

Limited conveyance facilities exist adjacent to the development and include the following within the street alignments as shown in Figure 3.

### Southern Blvd.:

- Beginning at Unser Blvd., a 12-inch gravity line is located in the northern portion of the right-of-way that collects wastewater from the west, including flows from Lift Station Nos. 3, 4, 5, and 11. The 12-inch gravity line flows east to Lift Station No. 2.
- A 10-inch force main exits Lift Station No. 2 proceeding to the east on the north side of Southern Blvd. Midway between Nicklaus Drive and Golf Course Road, the 10-inch force main discharges into parallel 12-inch gravity lines that converge

to one 12-inch gravity line at the intersection of the extension of 29<sup>th</sup> Street and Southern Blvd.

- The 12-inch line continues east along Southern Blvd. to the intersection of Jane Circle and Southern Blvd. where the line increases in size to 24 inches.
- The 24-inch gravity line continues to the intersection of Southern Blvd. and NM 528 where it enters the control manhole that allows flow to be split between Lift Station No. 10 and Wastewater Treatment Plant No. 1. Based on information contained in the *Comprehensive Wastewater System Planning Model for the City of Rio Rancho, Draft Submittal, March 31, 1998*, the limiting capacity in the Southern Blvd. corridor system appears to be approximately 2,083 GPM (3 MGD) and occurs in the 24-inch gravity line just upstream of the control manhole.

Unser Blvd.:

- No infrastructure exists.

Golf Course Rd.:

- No infrastructure exists.

Westside Blvd.:

- No infrastructure exists.

Table 1 summarizes the existing lift stations in the Southern Blvd. corridor and their estimated design capacities. No information was available for Lift Station No. 11.

**Table 1**  
**Summary of Existing Lift Station Flows and Design Capacities**  
**Along the Southern Blvd. Corridor**

Lift Station Number	Estimated Peak Inflow <sup>(1)</sup>		Pumping Capacity	
	1997 GPM	2020 GPM	GPM <sup>(2)</sup>	GPM <sup>(3)</sup>
3	278	563	610	250
4	56	56	240	250
5	11	11	25	45
2	1,215	1,507	1,285	2,000
10	1,638	2,337	2,200	2,000

(1) From *Comprehensive Wastewater System Planning Model for the City of Rio Rancho, Draft Submittal, March 31, 1998*

(2) From *Comprehensive Wastewater System Planning Model for the City of Rio Rancho, Draft Submittal, March 31, 1998*

(3) *City of Rio Rancho Water and Wastewater System Assets*

The City currently operates three wastewater treatment facilities. Wastewater Treatment Plant No. 1 and WWTP No. 2 are the facilities that would serve the proposed development.

#### Wastewater Treatment Plant No. 1

- Located at Sara Rd. and Stephanie Rd. on the northeast side of Intel
- Permitted for 1.0 MGD
- Currently operating at approximately 0.5 MGD average daily flow.
- WWTP No. 1 is fed by:
  - 24-inch line in Southern Blvd./Meadowlark Ln.
  - 8-inch line in Jackie Rd.
  - Lift Station No. 1
  - Lift Station No. 6
  - Las Palomas Lift Station
  - Trinity Lift Station
  - Sara's Meadows Lift Station
  - Gateway Lift Station
  - Lift Station No. 10
    - *Lift Station No. 10 is fed by:*
      - Lift Station No. 2
      - Lift Station No. 3
      - Lift Station No. 4
      - Lift Station No. 5
      - Lift Station No. 11

#### Wastewater Treatment Plant No. 2

- Located on the north side of the Montoyas Arroyo near the City Limits line with Corrales
- Permitted for 5.5 MGD
- Currently operating at approximately 3.0 MGD average daily flow.
- WWTP No. 2 is fed by:
  - Lift Station No. 10
  - 15-inch line serving area west of NM 528 discharging to Lift Station No. 12 adjacent to WWTP No. 2 on south side of the Montoyas Arroyo
  - Lift Station at WWTP No. 3 (River's Edge)

In order to evaluate the impact of the Cabezon development on the City's existing wastewater infrastructure, Wilson & Company, Inc. reviewed the results of the *Comprehensive Wastewater System Planning Model for the City of Rio Rancho, Draft Submittal, March 31, 1998*, to identify potential "choke points" in the existing system. For the purposes of this report, a choke point will be defined as a system component that limits adding new flow to the existing collection system. The analysis assumed that any flow produced by the Cabezon development, in the near term, would be received by the City's system at the 24-inch gravity collector near the intersection of Southern Blvd. and Jane Circle.

Specific system constraints have been assessed to ensure that no existing infrastructure or facility was impacted adversely by additional flows. These include:

#### Lift Station No. 10 and Downstream Constraints

- All flows in Southern Blvd. converge on Lift Station No. 10 at the northwest corner of NM 528 and Southern Blvd. At a control manhole just upstream of LS No. 10, flow is split between WWTP No. 1 and WWTP No. 2.
- Approximately 95% of the flow entering LS No. 10 is diverted to WWTP No. 2. According to the *Comprehensive Wastewater System Planning Model for the City of Rio Rancho, Draft Submittal, March 31, 1998*, Lift Station No. 10 is a duplex lift station with a single pump capacity of 2,200 GPM (3.17 MGD). With both pumps operating, its capacity is estimated to be 2,800 GPM (4.0 MGD).
- An 8-inch force main and a 12-inch force main exit Lift Station No. 10 and proceed north along NM 528 to the high point near High Resort Drive where they discharge to a pair of 12-inch gravity lines. The combined available capacity in these 12-inch gravity lines is approximately 868 GPM (1.25 MGD).
- The pair of 12-inch gravity lines combine into a single 12-inch line just south of the Montoyas Arroyo. At the Montoyas Arroyo, the 12-inch gravity line turns east, increases in size to 15-inches and flows into Lift Station No. 12. Maximum available capacity in this 15-inch line is approximately 486 GPM (0.70 MGD).
- The 5% of flow that is diverted to WWTP No. 1 continues east along Meadowlark Lane (Southern Blvd.), looping southward onto Stephanie Rd. and finally entering WWTP No. 1. The maximum available capacity in this 24-inch line is 1,042 GPM (1.50 MGD), based on a slope constraint at Meadowlark Lane and Stephanie Road.

Four potential choke points were identified in the collection system downstream of the tie-in location. Figure 3 shows the location of major wastewater infrastructure in the Cabezon development contributing area and the location of potential choke points. The controlling choke point for the existing wastewater collection network is located between Node 437 and Node 436 in the southern-most 15-inch gravity collector along the south side of the Montoyas Arroyo leading to Lift Station No. 12 (adjacent to WWTP 2). The maximum available capacity in this line is approximately 0.70 MGD (486 GPM). Assuming a peaking factor of 3.0 and a single-family equivalent (SFE) average daily wastewater flow of 210 gallons/SFE, approximately 1,111 SFEs could be added to this portion of the system before reaching its capacity. In addition to the 15-inch line described above, Lift Station No. 10 appears to have approximately 0.77 MGD (535 GPM) capacity available before improvements are necessary. Since Lift Station No. 10 feeds the critical 15-inch gravity line, both of these locations represent critical constraints to utilizing the existing City collection and treatment infrastructure for fully-developed conditions in Cabezon.

Regarding available treatment capacity, WWTP 1 is currently treating an estimated 0.50 MGD while WWTP 2 is treating an estimated 3.0 MGD, based on average daily flow. Wastewater Treatment Plant No. 1 is permitted to treat up to 1.0 MGD while WWTP 2 is permitted to treat up to 5.50 MGD. Conversations with the City Department of Utilities reveal that the City prefers not to operate WWTP 1 in excess of 0.70 MGD. Thus, limited capacity is available for use by Cabezon at WWTP 1 and there are no plans to expand it beyond its current capacity. Anticipated future expansions at WWTP 2 could add adequate capacity at WWTP 2; however, the collection system infrastructure is currently too limited to convey flow from a fully-developed Cabezon plan area to WWTP 2.

## **PROPOSED CONDITIONS**

To determine wastewater conveyance and treatment needs for the Cabezon Master Plan area, the following assumptions were used:

- Residential wastewater flow in Rio Rancho is 210 gpd/DU with a 3.0 peaking factor (per standard sewer availability review guidelines).
- Commercial wastewater flow is 1,230 gpd/acre with a 3.0 peaking factor (per standard sewer availability review guidelines).
- Minimum depth to invert of terminal upstream manhole of 6 feet.
- Minimum gravity pipe size of 8 inches.

- Minimum slope of gravity sewers per City of Albuquerque standards.
- Maximum flow in pipe based on a peak wet weather flow not-to-exceed  $0.75 d/D$ , where “d” is depth of flow in pipe and “D” is the internal diameter of the pipe.
- Minimum force main pipe size of 4 inches.
- Minimum velocity in force mains of 2 fps.
- Maximum velocity in force mains of 5 fps.

Table 2 summarizes projected wastewater generation for the development assuming the following baseline development conditions:

- 3,500 single family dwelling units
- 750 multi-family units
- 70.80 acres of commercial development
- 60 equivalent single family dwelling units associated with public-use lands

Average daily wastewater generation for Cabezon based on these conditions is estimated to be approximately 1.0 MGD. Peak daily wastewater generation for Cabezon is estimated to be 2.95 MGD. Inclusion of City wastewater flows results in an estimated average daily wastewater generation of approximately 3.1 MGD and a peak generation of approximately 6.1 MGD.

Table 3 summarizes anticipated wastewater generation for the Cabezon development, based on current projected land uses, and the inclusion of City of Rio Rancho flows. Average daily wastewater generation for Cabezon is estimated to be approximately 1.1 MGD. Peak daily wastewater generation for Cabezon is estimated to be 3.1 MGD. Average daily wastewater generation, including City flow, is estimated to be approximately 3.2 MGD with combined peak generation estimated at approximately 6.3 MGD.

A global review of the collection and treatment system capacity and capability within the entire City was conducted. Extensive discussions held with the City Department of Utilities Director revealed that significant citywide improvements in operations and treatment of wastewater were possible as a result of this project.

Construction of several collection lines and most significantly, a new wastewater treatment plant, are recommended as part of the development.

**Table 2  
Wastewater Generation Projections for Baseline Development Assumptions  
Cabezon Water System Master Plan**

		Wastewater Generation	
		Average Daily GPD	Peak Daily GPD
<b>Use Category</b>			
Baseline Residential Dwelling Units	3,500	735,000	2,205,000
Baseline Mixed Use Dwelling Units	750	157,500	472,500
Baseline Commercial Development	70.8 Acres	87,084	261,252
Baseline Public Use Equivalent Dwelling Units	60	12,600	12,600
Sub-Total for Cabezon Only		992,184	2,951,352
City Flow From Lift Station No. 2 (2)		1,400,000	2,170,700
City Flow From Wastewater Treatment Plant No. 1 (2)		700,000	980,000
Sub-Total for City of Rio Rancho Only		2,100,000	3,150,700
<b>Total Combined Wastewater Generation</b>		<b>3,092,184</b>	<b>6,102,052</b>
<b>Wastewater Generation Criteria</b>			
Use Category	Average Daily Flow	Peak Factor	
Residential	210 gpd per DU	3.00	
Commercial	1,230 gallons per acre C1	3.00	
School (With Cafeteria, but no gymnasiums or showers) (1)	15 gpd per person 500 person occupancy 36 Equivalent Residential DUs	0	
Community Center (Assume similar to school) (1)	15 gpd per person 250 person occupancy 18 Equivalent Residential DUs	0	
Park (1)	5 gpd per person 250 person occupancy 6 Equivalent Residential DUs	0	

(1) Taken from Texas Commission on Environmental Quality, Chapter 317, *Design Criteria for Sewerage Systems*

(2) Taken from *Comprehensive Wastewater System Planning Model for the City of Rio Rancho*.

## Recommended Improvements

Figure 4 illustrates the improvements recommended for the Cabezon Development. Overall, the proposed wastewater collection system will consist of gravity collection pipe ranging in size from 8-inches to 24-inches. The 8- through 15-inch lines will generally serve the Cabezon area west of the east branch of Black Arroyo. The 24-inch line will serve areas in Cabezon east of the east branch of Black Arroyo in addition to serving as a City interceptor. Ultimately, all flow from the basin draining directly to WWTP 1 and Lift Station No. 10 may be diverted to a proposed new treatment facility. A membrane bioreactor-type wastewater treatment facility will be constructed at the confluence of the east and west branches of the Black Arroyo. The proposed wastewater treatment facility will produce an effluent of quality suitable for reuse, recharge, or discharge. Design of the wastewater treatment facility will begin as soon as the Cabezon project is approved by the City. The facility will be sized initially to provide service to Cabezon under fully developed conditions (1.10 MGD) and to accommodate wastewater flow diverted from the City's existing Lift Station No. 2 and WWTP No. 1. Based on information contained in the *Comprehensive Wastewater System Planning Model for the City of Rio Rancho*, the year 2020 average daily flow projected at Lift Station No. 2 is projected to be approximately 1.40 MGD. Average daily flows projected to be diverted from WWTP No.1 are not expected to exceed 0.70 MGD for the remainder of the useful life of the facility. Thus, the total plant design capacity to be provided at the end of Phase 1 Cabezon development will be 3.20 MGD with Cabezon utilizing 1.10 MGD and the City utilizing the remaining 2.10 MGD of capacity. Pro-ration of design and construction costs between the Developer and the City will be determined subsequent to approval of the Master Plan. The facility will be on-line as the initial phase of Cabezon development (approximately 1,111 DUs) draws to a close. Flow will be diverted from Lift Station No. 2 to the new facility as soon as the facility is on-line. Flows from WWTP No. 1, and potentially Lift Station No. 10, will be diverted to the proposed Cabezon facility at a later, as yet, undetermined date. The initial phase of Cabezon development should be completed near the end of year two of the project and will include all of Areas 3, 4, 11 and approximately 25% of Area 7.

During initial stages of development, an interim wastewater lift station will be constructed that will discharge via an 8-inch force main to the existing 24-inch wastewater collector at Southern Blvd. and Jane Circle (Figure 4). This lift station and force main will not be eligible for impact fee credits since it will serve only the needs of the initial phase of Cabezon development and provide no joint service with the City. Upon completion of the Cabezon wastewater treatment

plant, the interim lift station will be decommissioned and the 8-inch force main converted into an internal wastewater reuse distribution line serving park areas and the improved east branch of Black Arroyo. Table 4 summarizes projected line sizes and carrying capacities based on projected flows and initial design slope considerations.

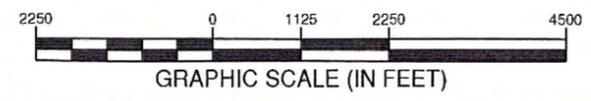
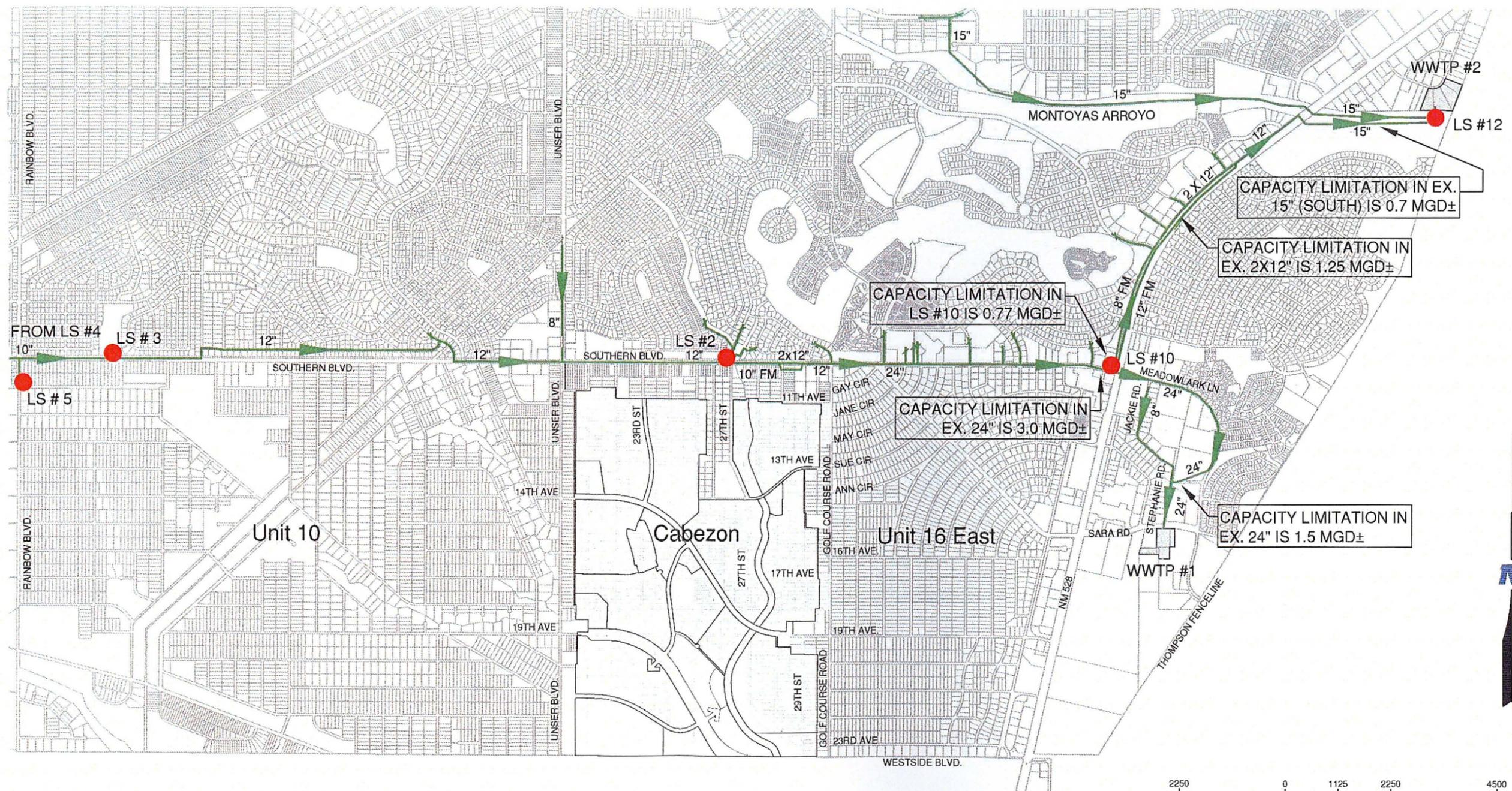
### **Phasing**

Phasing of the development is dependent on the availability of capacity in the City's existing sanitary sewer collection system. As stated previously, on a peak flow basis, the existing 15-inch gravity collection line in the Montoyas Arroyo (and to a lesser degree Lift Station No. 10) represents the limiting constraint in the existing collection system. Approximately 1,111 DUs can be developed and discharged to this portion of the City's collection system prior to consuming the available capacity in the 15-inch line. Table 3 summarizes projected wastewater flows for each of the developed areas proposed in Cabezon. Based on development in Cabezon alone, Area 3, Area 4, Area 11, and approximately 25% of the upper portion of Area 7 could be developed prior to exceeding the limiting capacity in the Montoyas Arroyo 15-inch line. These areas would contribute approximately 484 GPM (0.7 MGD) of peak flow. An interim lift station is proposed adjacent to SAS Flow Node 4 to accommodate these areas (refer to Figure 4). The interim lift station would, therefore, serve the Phase 1 portion of development. Once the proposed wastewater treatment facility is on-line, Phase 2, or development of the remainder of Cabezon would proceed. Improvements to the east branch of Black Arroyo resulting from developed flow reaching the arroyo will trigger construction of the 24-inch interceptor from Lift Station No. 2 to the proposed wastewater treatment facility.

**Table 4**  
**Summary of Proposed Wastewater Collection System Line Sizes, Design Flows, and Carrying Capacities**  
**Cabazon Wastewater System Master Plan**

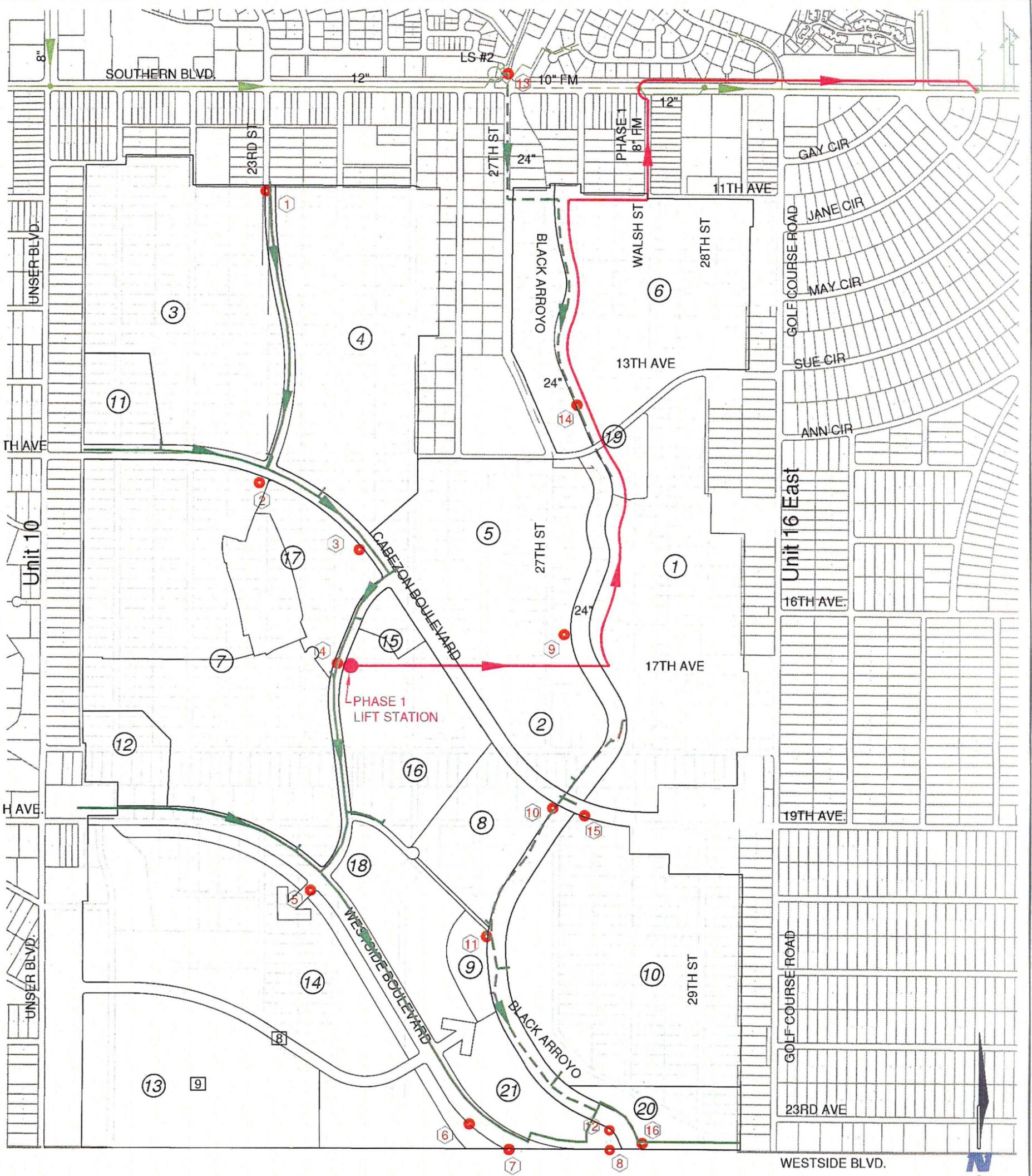
SAS Line No.	Terminates At SAS Node No.		Peak Flow At Node GPD	Line Size inches	Average Ground Slope For SAS Line Number %	Preliminary Design Slope For SAS Line Number (1) %	Capacity of Line at Design Slope and 0.75 d/D MGD	Velocity In Line at Design Slope and 0.75 d/D fps
1	2	Offsite+ Area 3	352,550	8	2.70%	2.03%	1.080	5.95
2	2	Area 11	36,900	8	1.48%	1.11%	0.747	4.12
3	3	Node 2	389,450	8	0.31%	0.60%	0.552	3.04
4	4	Offsite+3+4+11	650,900	10	2.55%	1.91%	1.784	6.29
5	5	Node 4+75% 7+15+17	1,101,793	10	1.15%	0.86%	1.197	4.22
6	5	12+ 25% Area 7	131,405	8	0.97%	0.73%	0.608	3.35
7	6	Node 5+18+50% Area 9	1,288,627	12	2.09%	1.57%	2.631	6.44
8	6	Area 14	660,240	8	1.52%	1.14%	0.760	4.19
9	7	Area 13	186,345	8	1.53%	1.15%	0.764	4.21
10	7	Node 6	1,948,867	12	2.11%	1.58%	2.639	6.46
11	8	Node 6+Area 13	2,135,212	15	1.39%	1.04%	3.882	6.08
12	9	50% Area 5	115,920	8	2.02%	1.52%	0.878	4.84
13	9	25% Area 5+25% Area 2	67,883	8	3.67%	2.75%	1.181	6.51
14	10	Node 9+50% arEA 2	203,648	8	1.80%	1.35%	0.827	4.56
15	10	50% Area 5+50% Area 2	135,765	8	2.74%	2.06%	1.022	5.63
16	11	Node 10+50% Area 8	375,323	10	2.25%	1.69%	1.679	5.92
17	11	Area 16+50% Area 8	43,410	8	2.17%	1.63%	0.909	5.01
18	12	Node 11+50% Area 9	472,913	12	1.60%	1.20%	2.300	5.63
19	14	LS 2+WWTP 1+Area 6	4,574,040	24	1.60%	1.20%	14.604	8.94
20	15	Node 14+area 19+area 1	4,710,740	24	1.60%	1.20%	14.604	8.94
21	16	Node 15+area 10+area 20	5,025,730	24	1.60%	1.20%	14.604	8.94
22	WWTP	Node 16	5,025,730	24	1.60%	1.20%	14.604	8.94
23	Ex. 24"		1	8	n/a	n/a	0.700	3.07
24	Ex. 24"		1	8	n/a	n/a	0.700	3.07

(1) Preliminary design slope is assumed to be 75% of ground slope when ground slope exceeds minimum required pipe slope. Minimum required pipe slope controls.



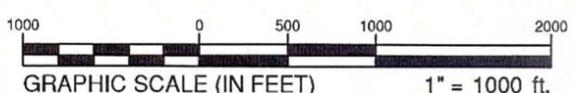
LEGEND	
	EXISTING LIFT STATION
	FLOW DIRECTION
	EXISTING GRAVITY WASTEWATER INFRASTRUCTURE
	EXISTING WASTEWATER FORCE MAINS

<b>CITY OF RIO RANCHO</b>	
 <b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021	<b>FIGURE 3</b> <b>CABEZÓN</b> <b>WASTEWATER MASTER PLAN</b>  EXISTING WASTEWATER SYSTEM IN CABEZÓN DEVELOPMENT WATERSHED



**LEGEND**

- 4 ● PROPOSED WASTEWATER NODE LOCATION/ID
- 2 PROPOSED WASTEWATER LINE ID
- 2 CABEZON DEVELOPED AREA ID
- ➔ FLOW DIRECTION
- - - CABEZON/CITY MAIN INTERCEPTOR
- EXISTING WASTEWATER SYSTEM
- PROPOSED CABEZON PHASE 1 WASTEWATER FORCE MAIN
- PROPOSED CABEZON WASTEWATER SYSTEM
- - - PROPOSED CABEZON/CITY WASTEWATER TREATMENT PLANT



 <b>CITY OF RIO RANCHO</b>	 <b>CABEZON WASTEWATER MASTER PLAN</b> FIGURE 4 <b>PROPOSED WASTEWATER SYSTEM</b>
 <b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021	

# CABEZON DEVELOPMENT

## TRANSPORTATION MASTER PLAN

Prepared for

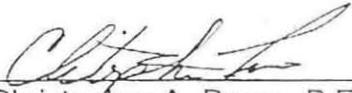
Curb, Inc.

MARCH 2003

Prepared by  
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### Document Certification

This document was prepared under the supervision and direction of the undersigned, whose seal as a Professional Engineer, licensed to practice in the State of New Mexico, is affixed below.



Christopher A. Perea, P.E.  
NM License No. 13686

3/26/03  
Date

(Seal)



## INTRODUCTION

The Cabezon Master Plan area is located within Unit 16 West, an incorporated area of the City of Rio Rancho (Figure 1, Section 1). Curb, Inc. proposes to develop Unit 16 bounded by Unser Boulevard on the west, Golf Course Road on the east, Southern Boulevard on the north, and proposed Westside Boulevard on the south, adjacent to the Sandoval-Bernalillo county line. The purpose of this Transportation Master Plan is to evaluate traffic demands on existing roadways and forecast proposed facilities resulting from the proposed development. This plan examines proposed conditions in the Cabezon development affecting vehicle and pedestrian travel along existing Unser Boulevard, Southern Boulevard, Golf Course Road, and the proposed Westside Boulevard and Cabezon Boulevard, in Sandoval County, New Mexico. Recommendations from this document can be used as a planning tool for the City of Rio Rancho and Curb Inc.

## EXISTING CONDITIONS

The development area is within an undeveloped area within the City limits of Rio Rancho, NM. The site is located south of Southern Boulevard and bounded by Unser Boulevard on the west, Golf Course Road on the east, and the Bernalillo/Sandoval County line on the south (Figure 2). North of the plan area, both sides of Southern Boulevard are fully developed as commercial properties with direct access to businesses via driveways. The west frontage of Golf Course Road is mixed use development and includes a daycare center, a church, a mini-storage and an office. East of Golf Course Road is well established residential development, much of it dating to the early days of Rio Rancho's incorporation as a city. Bounding the south side of the Cabezon development is existing residential housing and the AMAFCA Black Detention Basin, all within the City of Albuquerque. Lastly, Unser Boulevard's east frontage is undeveloped.

Southern Boulevard, classified as a principal arterial, currently has raised medians at the signalized intersections, designated left turn lanes, and two 12-foot driving lanes in each direction. Southern Blvd currently carries an average 34,500 average weekday trips (AWDT) between Unser Blvd. and Golf Course Road based on the Middle Region Council of Governments traffic flow model (MRCOG, 01). A portion of this model graphic is shown in Figure 3. Golf Course Road, a principal arterial presently under construction, includes two 12-foot driving lanes in each direction, raised medians, and designated left turn lanes. Reported AWDT is 11,600 AWDT between Southern Blvd. and 19<sup>th</sup> Street, and 21,100 AWDT between 19<sup>th</sup> Street and the future Westside Boulevard segment (MRCOG, 01). Unser Boulevard, classified as a principal arterial, currently includes two-

12-foot driving lanes in each direction, curb and gutter, raised medians, and storm drainage. The east Unser Boulevard frontage has a 10-foot asphalt walking/bicycle trail with a 3-foot buffer between the curb and the trail. Unser Blvd. currently carries 16,500 AWDT (MRCOG, 01):

Intersections surrounding the Cabezon plan area are described in Table 1 and shows signalization condition, intersection configuration, and existing lanes configurations Figure 4 shows the location of these intersections.

Table 1. Existing Intersection Conditions Surrounding the Cabezon Plan Area.

Intersection (E-W Road/N-S Road)	Description			
	Signal	4-Way/T-Intersection	Existing Lane Configuration	
			E – W	N – S
•Southern Blvd./Unser	YES	4-Way	2 – TLs 1 – Dedicated RTL 1 – Dedicated LTL	2 – TLs 2 – Dedicated LTLs 1 – Dedicated RTL 1 – Acceleration Lane (North) 1 – Acceleration Lane (South)
•Southern Blvd/21 <sup>st</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/22 <sup>nd</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/23 <sup>rd</sup> St	YES	4-Way	4 Lanes with Raised Median and Dedicated LTL	2 Lane
•Southern Blvd/24 <sup>th</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/26 <sup>th</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/27 <sup>th</sup> St	YES	4-Way	4 Lanes with Raised Median and Dedicated LTL	1 – Dedicated LTL 2 – Shared TL, RTL
•Southern Blvd/28 <sup>th</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/29 <sup>th</sup> St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/Walsh St	NO	T-Intersection	5 Lanes with Center LTL; no median	2 Lane
•Southern Blvd/Golf Course Rd	YES	4-Way	4 Lanes with Raised Median and Dedicated LTL and Dedicated RTL	South of Southern – 4 Lane with Raised Median and Dedicated LTL North of Southern – 2 Lane
•Golf Course Rd/Gay Cir	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/Jane Cir	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/May Cir	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/Sue Cir	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/Ann Cir	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/16 <sup>th</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/19 <sup>th</sup> Ave (Cabezon Blvd.)	YES	4-Way	1 – Dedicated LTL 2 – Shared TL, RTL	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/20 <sup>th</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/21 <sup>st</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/22 <sup>nd</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Golf Course Rd/23 <sup>rd</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Unser Blvd/19 <sup>th</sup> Ave	NO	T-Intersection	2 Lane	4 Lanes Divided by Raised Median with Dedicated LTL
•Unser Blvd/Black Arroyo Rd	NO	4-Way	2 Lane	4 Lanes Divided by Raised Median North of Black Arroyo Rd; 2 Lanes South of Black Arroyo Rd

TL = Through Lane, LTL = Left Turn Lane, RTL, Right Turn Lane

## PROPOSED CONDITIONS

Access to the development is via three proposed roads; Westside Boulevard, Cabezon Blvd., and Western Hills Dr. as shown in Figure 5, Proposed Conditions. Population growth within this sub-area has been substantial over the past few decades. Population employment projections published by MRGCOG indicate that this trend will continue (MRGCOG, 01).

Construction of Westside Boulevard and Cabezon Boulevard, will serve a large developing urban area within the Rio Rancho metropolitan area. The Westside/McMahon Corridor Study (*Parsons Brinkerhoff, 99*) identifies this corridor as one of the fastest growing subareas of the metropolitan area. Further, analysis shows that population and employment are expected to increase at a rate of 797% and 683%, respectively, within the 20-year planning horizon used for the corridor study.

Within the Cabezon Master Plan development area, proposed land uses include single family residential, commercial and mixed-use development, an new elementary school, several community parks, and open space (Figure 5). Table 2 displays assumptions for development density to determine traffic generation rates for peak hour within zones established by MRGCOG.

**Table 2: Proposed Land Use by Traffic Planning Zone**

Development Type	MRCOG Traffic Analysis Zone			Total
	15210	15220	15230	
<b>Residential</b>	#/Units			#/Units
Single Family	1470	1120	910	3500
Multi-Family	315	240	195	750
<b>Commercial</b>	Sq Ft			Sq Ft
Retail	140,000	55,000	305,000	500,000
Service	140,000	55,000	305,000	500,000

### Trip Generation

Trip generation analysis was conducted by MRGCOG specific to the development conditions planned for this development. The average vehicle trip ends are based on these ITE Trip Generation classification methodologies:

1. LAND USE 210: Single Family Detached Housing
2. LAND USE 220: Apartments
3. LAND USE 814: Retail
4. LAND USE 911: Services

A summary of average weekday trip (AWDT) results is shown in Figure 6. Table 3 shows determination of AWDT based on Land Use 210, 814, and 911. Engineering judgment and above

average trip generations by proposed development, was used in translating trip rates to AWDT. It should be noted that, as phased development occurs and retail/service businesses are established, further detailed engineering study and trip generation analysis may be conducted to solidify trip routing and signal improvements. Engineering study should occur in conjunction with the development design and platting process.

Finally, AWDT trip distribution among Cabezon Boulevard, Westside Boulevard, Western Hills Dr., and Collector No. 1 were distributed in coordination with the Westside/McMahon Corridor Study (Parsons Brinkerhoff, 99).

### **Capacity Analysis**

Capacity analysis is a set of procedures for estimating the traffic carrying ability of facilities over a range of defined operational conditions. A principal capacity analysis objective is to estimate the maximum number of vehicles that a roadway facility can accommodate with reasonable safety during a specified time period. Level of Service (LOS); is the *capacity* quantitative measure used to characterize operational conditions within an urban roadway traffic stream. Therefore, in analyzing capacity of an urban roadway, we are analyzing those factors (such as free flow speed, peak hour factor, signal density, etc.), which measure LOS.

Urban roadway capacity at fully developed conditions was analyzed to determine roadway operations using the *Highway Capacity Manual 2000 (HCS), Exhibit 10-7 "Service Volumes Table"* (see Figure 7). Analysis results for Westside Blvd., Cabezon Blvd., Western Hills Drive, and Collector No. 1; are discussed below. Typical roadway recommendations for these urban facilities are provided in the following section, based on LOS.

Westside Blvd. must accommodate travel demand as intra-subarea and inter-subarea travel occurs. Preliminary travel projections prepared by MRGCOG for the Westside/McMahon corridor show substantial north/south demand, as well as a substantial east/west demand within the corridor linking NM 528 and Coors Blvd. Therefore, Westside Blvd. is classified as *high speed, principal arterial* providing *high mobility* in the east-west direction. According the Westside/McMahon corridor study, the number of trips anticipated east-west could exceed 45,000 vehicles per day east of Unser Blvd. and approximately 14,000 vehicles per day west of Unser Blvd.

Cabezon Blvd. is intended to alleviate Westside Blvd. traffic congestion by providing a secondary east-west connection between Unser Blvd. and Golf Course Road, both principal arterials. The HCS characterizes this roadway as *intermediate urban street with moderate driveway/access-point density*. Roadside development density is moderate, speed limits in the range of 30-40 mph, and potential spacing of 4-10 traffic signals within 1-mile roadway segments. The number of trips expected to utilize proposed Cabezon Blvd. is 30,000 AWDT east-west over a 20-year horizon. Western Hills Drive and Collector No. 1 will accommodate approximately 17,000 AWDT each.

Western Hills Drive and Collector No. 1 are internal, north-south roadways intended to serve Cabezon development and provide access to the major roadway network. HCS characterizes these collectors as low speed (below 35 mph), collectors with high driveway/access-points. Pedestrian interference is expected in addition to 6-12 traffic signals within 1-mile roadway segments.

### **Level of Service**

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at each signal. This qualitative measure ranges from Level A being ideal, to Level F, describing street flow of extremely low speeds, typically 25% to 33% of unimpeded free flow speed (FFS).

Urban street classification listed in Exhibit 10-7 "Service Volumes Table", is somewhat different from that used by AASHTO. AASHTO's function classes are based on travel volume, mileage, and the characteristic of service the urban street is intended to provide. HCM uses a second classification step to determine the appropriate design category of the arterial. Design category depends on posted speed limit, signal density, driveway/access-point density, and other design features. The third step is to determine the appropriate street class on the combined basis of functional and design category. Exhibit 10-3 and 10-4 of the Highway Capacity Manual, were utilized in recommending roadway typical sections. Hourly, single lane volumes were determined assuming 10% of the AWDT. Urban streets show less variation in peak-hour traffic because most users are daily commuters or frequent users, and occasional and special event traffic is at a minimum. Therefore, 10% of the AWDT is a safe and conservative approach for determining single lane capacities (HCM 200, 8-7).

A minimum four-lane Principal Arterial roadway section (2 lanes in each direction) is recommended for Westside Blvd., with provision for conversion to 6-lanes to accommodate the 20-year planning horizon. This recommendation is consistent with the *Westside/McMahon Corridor Study* and accommodates a 20-year design life at LOS C. This corridor, preserved within a dedicated right-of-way of 156 feet, will allow construction of 6 traffic lanes, bike lanes, a 16-foot median, and meandering multi-use paths on both sides of the street (Figure 7).

Cabazon Blvd, classified as a Minor Arterial, will include a minimum four-lane urban street section (2 lanes in each direction), with raised 16-foot wide median within a 120-foot ROW. In addition, a 12-foot wide meandering multi-use path is planned for both sides of the street (Figure 8). This recommendation accommodates a 20-year design life at LOS C, for a *Class III* minor arterial.

Recommendations for Western Hills Dr. and Collector No. 1 include a three lane (1 lane in each direction with a continuous left turn lane), undivided roadway with no raised medians (Figure 9). Western Hills Dr. and Collector No. 1 may be classified as collector streets. This recommendation accommodates a 20-year design life at LOS C, for a *Class IV* minor arterial.

### **Access Geometry**

Access management along Unser Boulevard complies with the Albuquerque Metropolitan Planning Area Map, dated July 3, 2002 and as amended by Appendix D – *Addendum to the Long Range Roadway System*. Unser Boulevard is high capacity, limited access Principal Arterial from Rio Bravo to Northern Boulevard. Section III. *Access Limitation*, subparagraph K., sets forth the right-of-way requirements for Unser Boulevard at 156 feet. Unser access from Westside Boulevard shall be limited to a full access at-grade intersection.

Presently, Subparagraph M., sets forth the access limitations with the potential Cabazon Development. In this area, access that is more frequent is allowed if driveways are not located closer than approximately 400 feet from adjacent access points. However, it is recognized that full access to Cabazon Boulevard off Unser Boulevard may be limited, due to MRGCOG Policy or signal timing in the near future. Access coordination will be required by City of Rio Rancho, to ensure adequate free flow speed on the major roadways.

All traffic resulting from the development requires access control. Traffic will enter and exit the Cabazon Master Plan area via five major access points: the intersections of Unser Blvd./Westside

Blvd, Unser Blvd./Cabezon Blvd., Southern Blvd./Collector No. 1, Golf Course Road/Cabezon Blvd., and Golf Course Road/Westside Blvd. These major intersections will have a minimum turning radius of 50 feet while internal streets will have a minimum turning radius of 30 feet to ensure safe access for emergency vehicles and site circulation.

### **Signalization Needs**

A Traffic Control Signal Needs Study was conducted based on the Manual of Urban Traffic Control Devices (MUTCD, 2000), Section 4C.01 *Studies and Factors for Justifying Traffic Control Signals*. Traffic Signal Warrant 1, Eight-Hour Vehicular Volume, provides two criteria, which warrant control signal installation consideration. Initial inspection of Condition A – Minimum Vehicular Volume, justifies further engineering study as phased construction of the Cabezon development occurs. Peak hour volumes for Westside Blvd., Cabezon Blvd., Western Hills Dr. and Collector 1 will be reviewed against Condition A – Minimum Vehicular Volume, minor approach, as each roadway is constructed and adjacent development is completed.

An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of intersection location should be performed to determine whether installation of a traffic signal is justified at the following intersections: Unser/Cabezon Boulevard, Unser/Westside, Golf Course/Cabezon, Golf Course/Westside, Western Hills/Cabezon Boulevard, Collector No. 1/Cabezon Boulevard, and Collector No. 1/Westside Boulevard as phased development construction is completed.

### **Pedestrian Service Needs**

Pedestrian travel patterns for Cabezon Development were analyzed based on elementary and school children (K-5) going from their house to the proposed elementary school and the existing middle school. Because the proposed school site is centrally located, high-density pedestrian locations are difficult to determine. It is anticipated that a large number of children from the subdivision plan to attend the proposed school as well as the existing elementary school.

The amount of existing traffic along offsite roadways, Unser Blvd. and Golf Course Road, may prove crossing difficult. Under the Department of Education guidelines provided by the Rio Rancho School District, Unser Blvd. and Golf Course Road, could be classified as a "Hazardous Walking Condition", making the students eligible for busing. Nonetheless, mid-block crossing should be discouraged by designating striped crosswalks at major signalized intersections with pedestrian

push buttons.

On-site roadways, Westside Blvd., Cabezon Blvd., Western Hills Dr., and Collector No. 1, will accommodate pedestrians in a similar manner. Mid-block crossing will be discouraged. As construction is completed, further engineering study and coordination with Rio Rancho Public Schools will address needs for crossing protection, location of cross guards and/or patrols, and permanent signing and striping for school zoning.

## RECOMMENDATIONS

The proposed typical section for Westside Boulevard, between Unser Boulevard and Golf Course Road, will be built within a 156 foot right-of-way and designated as a principal arterial. Initially, the section will consist of two 12 foot driving lanes in each direction, separated by a 40 foot raised median with temporary asphalt or pinned concrete curb on either side, and standard gutter on outside of the roadway lanes. On the north and south sides of the road, a 12-foot meandering multi-use path will be separated by a meandering buffer. Later, a third driving lane can be added in each direction by narrowing the median to 16 feet. Westside Boulevard, between Golf Course Road and NM 528, will require conversion to a 4-lane section (2 lanes in each direction) to accommodate the 20-year full build out horizon. Design for 4-lane conversion requires compliance with City of Albuquerque *Design Process Manual* (DPM) design criteria and review processes. Maintenance and operation of portions of the ROW within the City of Albuquerque can be maintained by the City of Rio Rancho.

The proposed typical section for Cabezon Blvd. should be built within 120-foot right-of-way and classified as a minor arterial. The section will consist of two 12-foot driving lanes in each direction, separated by a 16 foot raised median with 1-foot 6-inch median curb & gutter on either side. Adjacent to the outside driving is a 2-foot 7-inch curb & gutter on either side. A 12 foot meandering sidewalk will be separated by a varying buffer between curb & gutter, and between sidewalk and right-of-way.

The proposed typical section for Western Hills Dr. and Collector No. 1, should be built within 78 foot right-of-way and classified as collector streets. The section will consist of two 12-foot driving lanes in each direction, 16-foot wide continuous left turn lane, 6 foot sidewalk on the one side, and a 12-foot meandering path on the other side. Adjacent to the outside driving is 2-foot 7-inch curb and gutter on either side. The meandering path and 6-foot sidewalk will be separated by a varying buffer between curb and gutter between the walking path and the edge of the right-of-way. Further engineering study following phased development completion, may justify intersection lane configurations in order to meet 20-year horizon build out.

It is recognized that roadway typical sections for the two collector streets are developed based on forecasted land use of a large developing urban area within the Rio Rancho metropolitan. Actual development outside of Cabezon Development may steer roadway details to accommodate future actual traffic volumes and/or maintain acceptable facility performance. Configuration considerations include dual-left turning lanes, increase turning lane storage lengths, and signal timing.

Overall, details regarding lighting, permanent signage and striping will adhere to the Manual of Uniform Traffic Control Devices, latest edition will be addressed through the City's review and approval process.

### **PHASING**

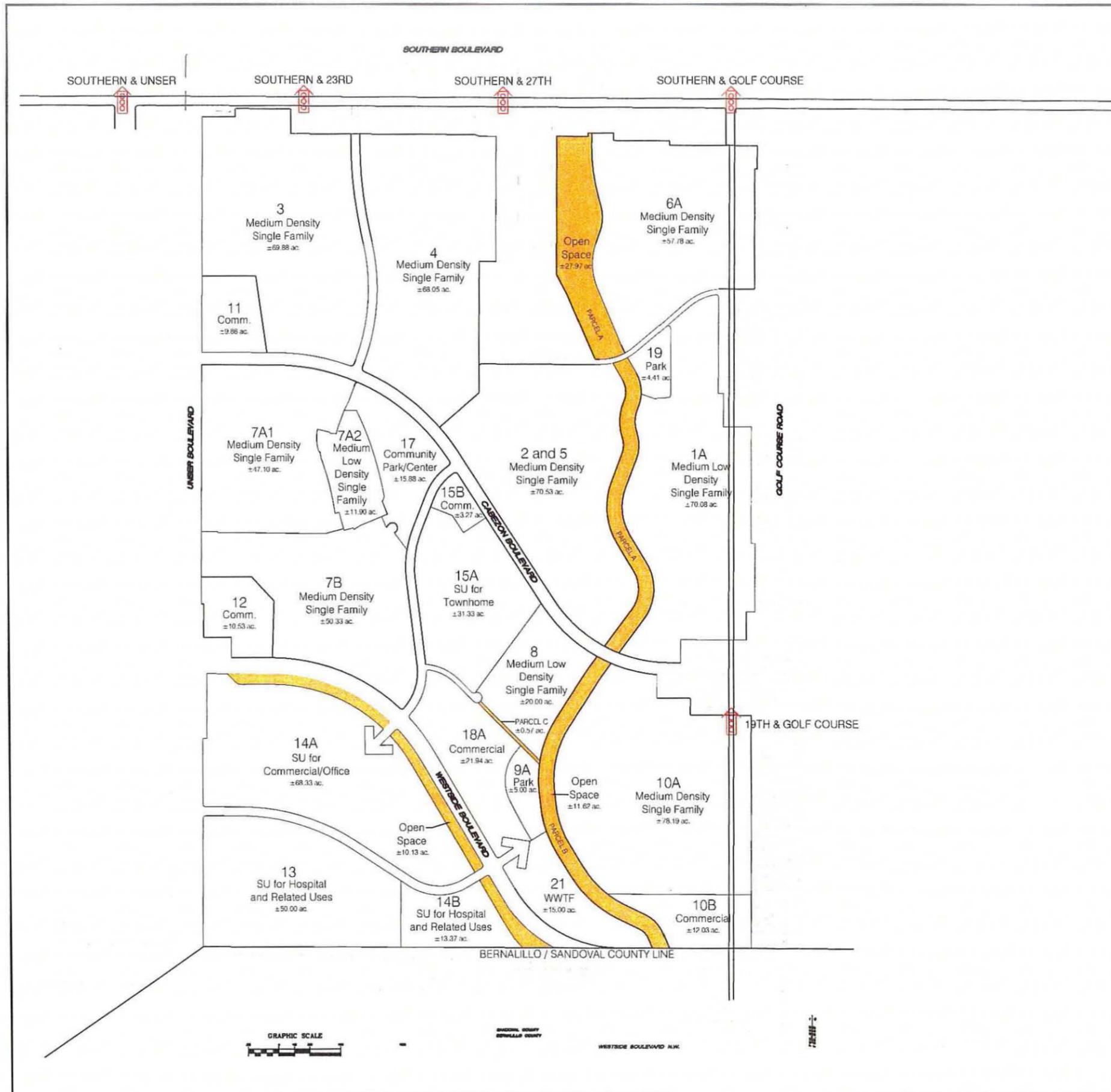
Construction within the development is expected to begin in the area of the Cabezon Road/Unser Blvd. intersection. Therefore, construction of Cabezon Road, and portions of Western Hills Dr and Collector No. 1 are planned in the near term. Later, market demand will dictate locations of further improvements. Other infrastructure needs are required to serve full build conditions including water, sewer and drainage facilities. The need for these improvements is expected as growth expands east and southward from the initial development area. Naturally, roadway construction is required to support construction in other areas of the Cabezon Master Plan area. In addition, arroyo-crossing structures are needed and will be constructed, as higher service levels are required.

**REFERENCES**

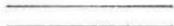
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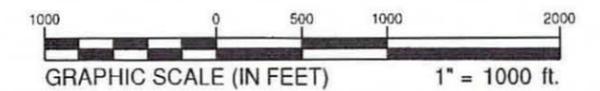


Figure 3: 2001 Existing Model Traffic Flows, MRGCOG



**LEGEND**

-  EXISTING SIGNALIZED INTERSECTION
-  PROPOSED CABEZON DEVELOPMENT
-  EXISTING ARTERIAL/COLLECTION STREETS
-  PROPOSED ROW



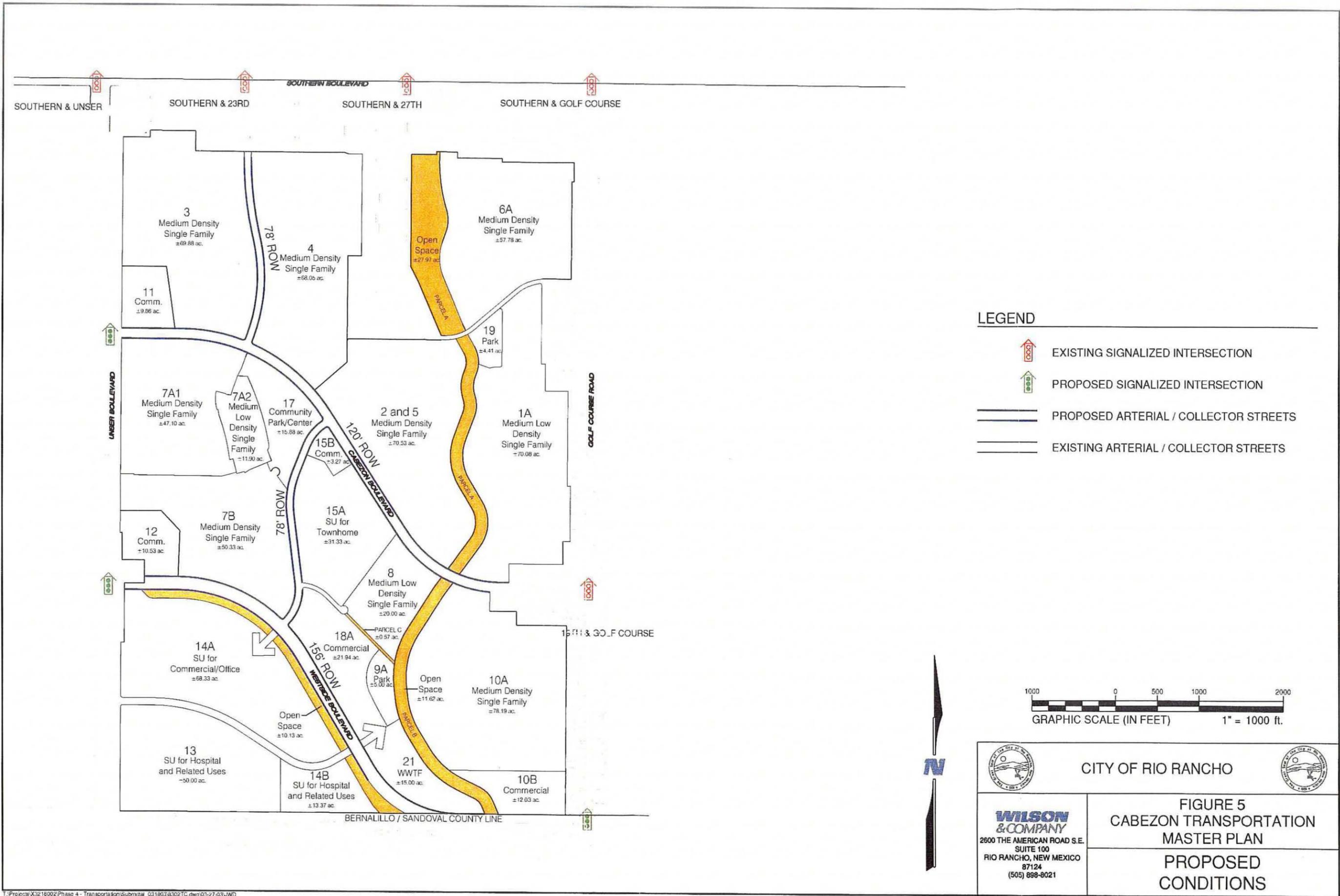
CITY OF RIO RANCHO



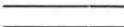
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 RIO RANCHO, NEW MEXICO  
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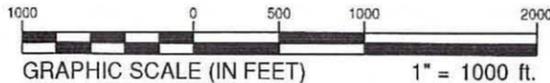
**FIGURE 4  
 CABEZON TRANSPORTATION  
 MASTER PLAN**

**EXISTING  
 CONDITIONS**



**LEGEND**

-  EXISTING SIGNALIZED INTERSECTION
-  PROPOSED SIGNALIZED INTERSECTION
-  PROPOSED ARTERIAL / COLLECTOR STREETS
-  EXISTING ARTERIAL / COLLECTOR STREETS



	<p>CITY OF RIO RANCHO</p>	
<p><b>FIGURE 5 CABEZON TRANSPORTATION MASTER PLAN</b></p>		
<p><b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021</p>	<p><b>PROPOSED CONDITIONS</b></p>	

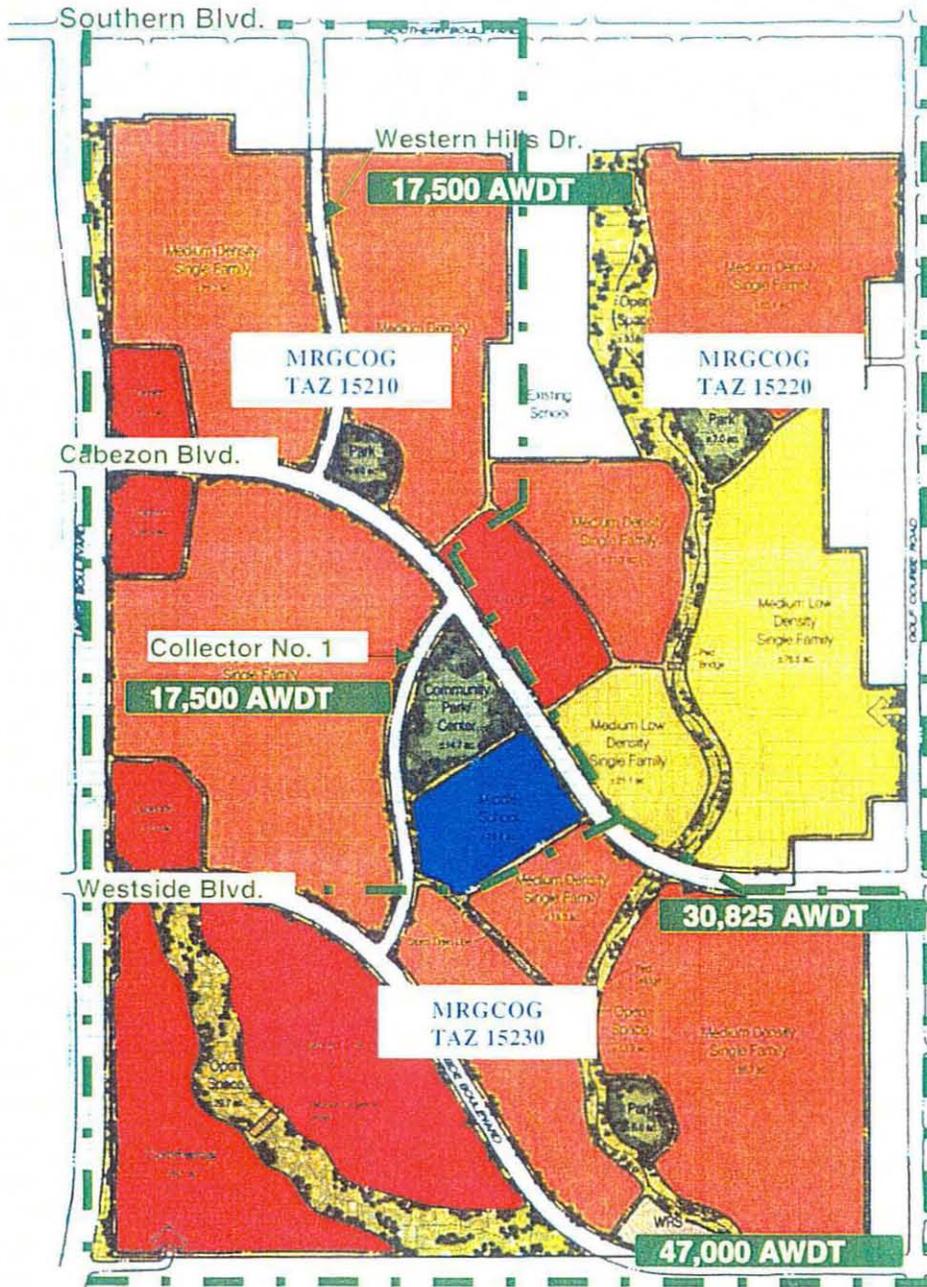


Figure 6: 2025 Trip Analyses by Zone for Cabezón Development

Conceptual Master Plan  
**CABEZON**  
RIO RANCHO, NEW MEXICO

EXHIBIT 10-7. EXAMPLE SERVICE VOLUMES FOR URBAN STREETS  
(SEE FOOTNOTES FOR ASSUMED VALUES)

Lanes	Service Volumes (veh/h)				
	A	B	C	D	E
Class I					
1	N/A	860	930	1020	1140
2	N/A	1720	1860	2030	2280
3	N/A	2580	2790	3050	3430
4	N/A	3450	3710	4060	4570
Class II					
1	N/A	N/A	670	850	890
2	N/A	N/A	1470	1700	1780
3	N/A	N/A	2280	2550	2670
4	N/A	N/A	3090	3400	3560
Class III					
1	N/A	N/A	480	780	850
2	N/A	N/A	1030	1600	1690
3	N/A	N/A	1560	2410	2540
4	N/A	N/A	2140	3220	3390
Class IV					
1	N/A	N/A	540	780	800
2	N/A	N/A	1200	1570	1620
3	N/A	N/A	1900	2370	2430
4	N/A	N/A	2610	3160	3250

Notes

N/A - not achievable given assumptions below.

This table was derived from the conditions listed in the following table.

	Class			
	I	II	III	IV
Signal density (sig/mi)	0.8	3	5	10
Free-flow speed (mi/h)	50	40	35	30
Cycle length (s)	110	90	80	70
Effective green ratio	0.45	0.45	0.45	0.45
Adj. sat. flow rate	1850	1800	1750	1700
Arrival type	3	4	4	5
Unit extension (s)	3	3	3	3
Initial queue	0	0	0	0
Other delay	0	0	0	0
Peak-hour factor	0.92	0.92	0.92	0.92
% lefts, % rights	10	10	10	10
Left-turn bay	Yes	Yes	Yes	Yes
Lane utilization factor	According to Exhibit 10-23, Default Lane Utilization Factors			

Figure 7:  
HCM 2000

### TABLE 3

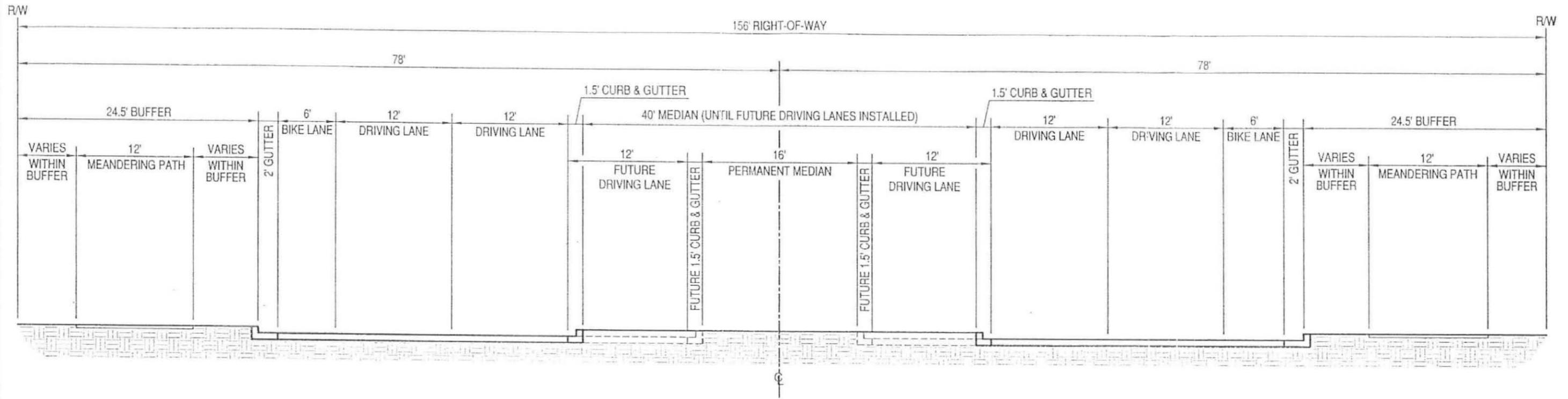
## AVERAGE WEEKLY DAILY TRAFFIC TABLE (AWDT)

		PM Peak Hour Generator	
<b>RESIDENTIAL: 4250 Units</b>			
Single Family	1.02 Trips/unit @ 3500 Units	(210)	35,700 AWDT
Multi-Family	0.67 Trips/unit @ 750 Units	(220)	5,025 AWDT
			40,725 AWDT
<b>COMMERCIAL: 1,000,000 FT<sup>2</sup></b>			
<u>RETAIL</u>	3.12 Trips <sup>1</sup> /1000 GFA @ 500,000 FT <sup>2</sup>	(800-899)	30,000 AWDT
<u>SERVICE</u>	6 Trips <sup>1</sup> /1000 GFA @ 500,000 FT <sup>2</sup>	(911)	42,100 AWDT
			72,100 AWDT

DEVELOPMENT

TOTAL:                      112,825 AWDT

<sup>1</sup>Trip rates for retail are conservative as lower generation rates are expected for a larger portion of retail business



PRINCIPAL ARTERIAL STREET SECTION  
(WESTSIDE BOULEVARD)  
SCALE: NTS  
(6) LANES, MEDIAN, SHOULDER, & (2) MEANDERING PATHS



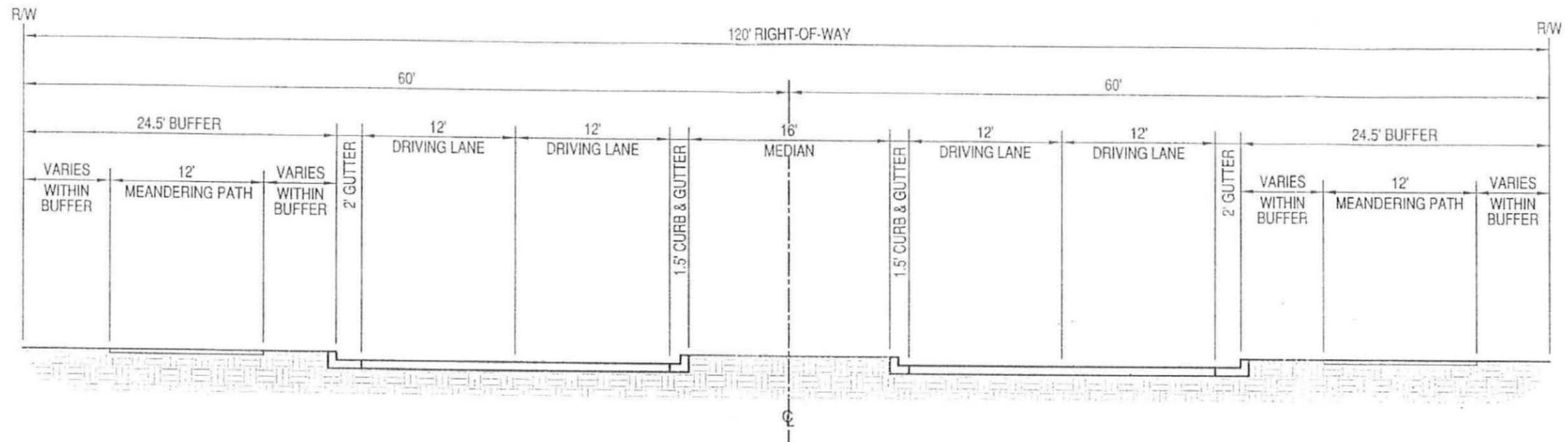
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FIGURE 8  
CABEZON TRANSPORTATION  
MASTER PLAN

PRINCIPAL ARTERIAL  
STREET SECTION

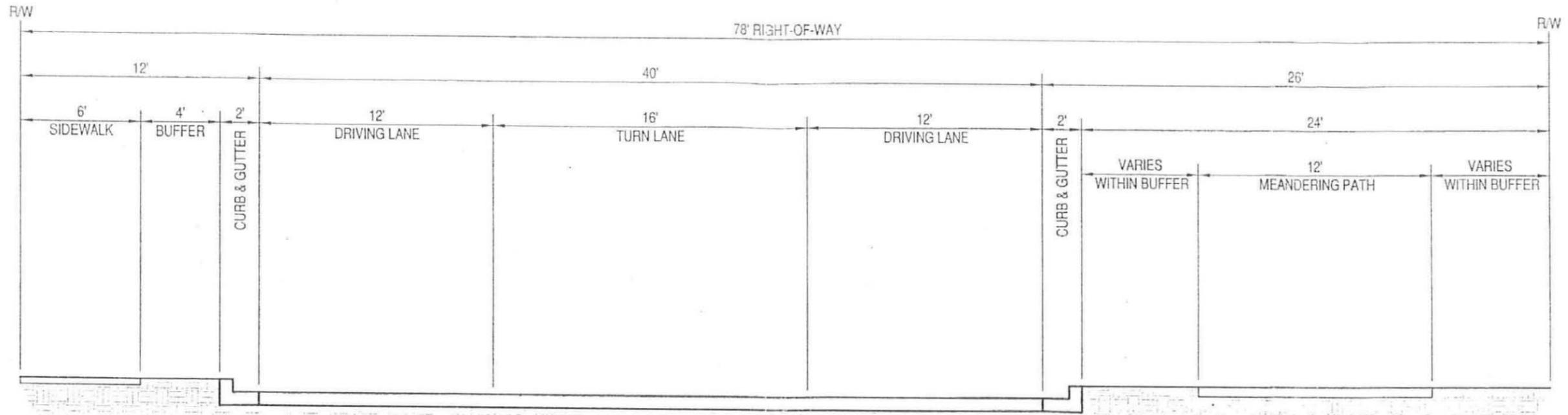


**MINOR ARTERIAL STREET SECTION  
(CABEZON BOULEVARD)**

SCALE: NTS

(4) LANES, MEDIAN, SHOULDER, & (2) MEANDERING PATHS

	<p>CITY OF RIO RANCHO</p> 
<p><b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021</p>	<p>FIGURE 9 CABEZON TRANSPORTATION MASTER PLAN</p> <p><b>MINOR ARTERIAL STREET SECTION</b></p>



**COLLECTOR STREET SECTION**  
 (COLLECTORS 1 & 2)  
 SCALE: NTS  
 (2) LANES, (1) TURN LANE, SHOULDER, SIDEWALK, & MEANDERING PATH.

	<b>CITY OF RIO RANCHO</b>	
<b>FIGURE 10</b> <b>CABEZON TRANSPORTATION</b> <b>MASTER PLAN</b>		
 <b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021		<b>COLLECTOR</b> <b>STREET SECTION</b>

# CABEZON DEVELOPMENT

# DRAINAGE MASTER PLAN

Prepared for

**Curb Inc.**

Prepared by

***WILSON***  
***& COMPANY***  
*ENGINEERS & ARCHITECTS*  
2600 The American Rd, SE  
Suite 100  
Rio Rancho, NM 87124

**FINAL SUBMITTAL VERSION**

**March 27, 2003**

I, Charles M. Easterling, P.E., do hereby certify that this document was prepared by me or under my direction, and is true and correct to the best of my knowledge and belief and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Charles M. Easterling, P.E.  
NMPE No. 6411

Date

## EXECUTIVE SUMMARY

The Cabezon Development encompasses over 900 acres of undeveloped land located in the City of Rio Rancho, Sandoval County. The area is bounded by the Sandoval County line on the south, Unser Blvd. on the west and Golf Course Blvd. to the east. The northern boundary is a variable line approaching existing development south of Southern Blvd. The east and west branches of the Black Arroyo traverse the site. Curb, Inc. is proposing to develop this area for residential, mixed use and commercial uses. This drainage plan serves to support drainage analysis necessary to assess the effects of development. Thorough review of the Black Arroyo Watershed Master Plan (BLWMP) written by ASCG (2002) was conducted with attention to its recommendations and goals. If fully implemented in accordance with this plan, the Cabezon Development will enhance the drainage and flood control infrastructure in the area, meet the community's storm water quality objectives and preserve the capacity of Black Dam, an AMAFCA facility. Goals defined within the BLWMP and followed within the Cabezon plan include:

- Subsequent drainage plans follow the general assumptions and guidelines of the BLWMP

*Phasing and basic drainage elements are specified herein to govern drainage amendments that will accompany the development of each phase.*

- The Black Dam, owned and maintained by AMAFCA is not compromised due to increased development

*Ultimate Conditions are modeled and shown to not compromise Black Dam. In addition, specification is made to ensure that the actual volume of the dam at the time of each phase is evaluated within an appropriate model for that phase.*

- Water quality and sediment issues are addressed in a manner that meets requirements of the Clean Water Act and reduces sediment contributions to the Black Dam

*Water quality/sediment facilities are called out for all on-site flows and cooperation with SSCAFCA is specified for the treatment of all off-site flows.*

- All permanent facilities will incorporate multiple uses to the maximum extent practicable.

*Trail and open space system alongside channels and roadways. Extensive park system with detention and WQ facilities included in certain parks.*

## INTRODUCTION

The 912-acre Cabezon Development is located in Unit 16 West in the City of Rio Rancho (Section 1, Figure 1). The goal of this Drainage Master Plan is to assure that storm water can be collected and conveyed to minimize flood hazards and protect human life and property. In addition, provisions for water quality enhancement were also considered to be consistent with goals established by the Clean Water Act, NPDES Phase II. Planned land uses within the Master Plan Area include residential, commercial, mixed uses, a school, several parks and a wastewater treatment plant (Section 1, Figure 2). This plan discusses existing drainage analyses conducted by ASCG (BLWMP, 2002) and establishes hydrologic conditions resulting from the proposed development.

The Black Arroyo Watershed Master Plan (BLWMP) describes existing conditions due to two major arroyos crossing the site, the East and West Branches of Black Arroyo, and the impacts of development on these arroyos and the Black Dam. The primary guidelines established by the BLWMP are:

- subsequent drainage plans follow the general assumptions and guidelines of the BLWMP
- the Black Dam, owned and maintained by AMAFCA is not compromised due to increased development
- water quality and sediment issues are addressed in a manner that meets requirements of the Clean Water Act and reduces sediment contributions to the Black Dam
- all permanent facilities will incorporate multiple uses to the maximum extent practicable.

This report establishes the base guidelines that will be followed as each phase moves through the design and approval process. Of special concern, as mentioned above, is the capacity of the Black Dam. The watershed analysis supporting this report addresses a fully developed watershed and a fully constructed Black Dam. Currently, the Black Dam has been constructed to an intermediate phase. For each successive phase, an analysis that considers the impact of new development versus the storage volume of Black Dam must be performed.

## EXISTING CONDITIONS

Cabezon is located within Unit 16 West within the City of Rio Rancho. The approximately 900 acre area, formerly named Unit 16, bounded by Golf Course Road on the east, Unser Drive on the west, and the Sandoval County line on the south makes up the development area. The northern boundary is a variable line south of Southern Blvd (Section 1, Figure 2). Lands within Cabezon generally slope north to south varying in east-west gradient. Cabezon is divided by the East and West Branches of the Black Arroyo. The two branches converge just south of the site at the Black Dam.

A comprehensive developed condition hydrologic model was created to assess drainage conditions and structures necessary as a result of development. As part of the model, the following assumptions were made:

- Land treatments for developed areas north of Southern are based on existing conditions and assumptions compatible with the BLWMP
- Land treatments from the BLWMP Ultimate Conditions model are used for those areas that remain undeveloped
- Runoff from offsite watersheds must be conveyed through Cabezon
- Ensure that Black Dam capacity is not exceeded
- Include "first flush" sediment and water quality measures for onsite and offsite flows
- Bulking factors consistent with BLWMP are included (18% for undeveloped areas, 6% for developed areas)

Hydrologic analyses in this report conform to Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 (COA DPM) and the BLWMP. Hydrologic modeling was performed using the Arid-lands Hydrologic Model, August 1997 by Anderson Hydro (AHYMO\_97). The 100-year 24-hour return frequency storm was used as the basis of this analysis.

Review of available soils information indicated Wink Series soils and was verified by field identification. The description of this series is found in the USDA Natural Resources Conservation Service soil mapping of Bernalillo County and portions of Sandoval County. The Wink series is described as a well-drained soil comprised mostly of sandy loam. The surface layer is brown fine sandy loam and sandy loam about 11 inches thick. The subsoil is a 16-inch thick layer of light brown sandy loam. Below is a 60 inch layer of pinkish gray and pinkish white sandy loam which is calcareous and moderately alkaline. Water erosion hazard is moderate,

while wind erosion hazard is moderate to high. These areas support wildlife, grazing and open space uses.

These soils are derived from an interaction of volcanic activities, fluvial and aeolian deposition processes. Wind energy along with hydrologic transport effects has interbedded this material over time. The Wink Series fits within Hydrologic Group B, implying low to moderate runoff potential.

## PROPOSED CONDITIONS

Currently, developed portions of the Black Arroyo watershed are primarily north of Southern Boulevard. Figure 3 shows both proposed watershed basins and existing sub-basins extracted from BLWMP for on-site areas. Proposed sub-basins were delineated based on development areas and their relationship to existing topographic conditions. Development of the proposed conditions model required detailed review of assumptions within the BLWMP model to assess land treatments, development density and drainage facilities both existing and proposed in the near term. The following portions of the BLWMP were adapted for use in the Cabezon hydrologic model

- The Ultimate condition model was chosen for undeveloped offsite areas to accommodate conservative land treatment conditions.
- A modified Ultimate conditions model was adapted for developed areas. A lower level of impervious area (Land Treatment D) was assigned based on a review of sub-basin 205. Using 1993 orthophotography, rooftops were enumerated and impervious area adjusted using the DPM's impervious area formula for residential development as outlined in SSCAFCA and City of Rio Rancho policies and guidelines. This methodology has been approved based on review by ASCG performed at the request of SSCAFCA. This is documented through correspondence with SSCAFCA (enclosed)
- Routing of Sub-basin 211 within the BLWMP was adjusted given Cabezon drainage facilities will accommodate this flow prior to construction of proposed facilities on Southern Blvd. The Cabezon Development is accepting the maximum flows predicted from the 23<sup>rd</sup> St. flow. It was assumed that this flow arrives at the northern boundary of Cabezon and must be routed at this point.

- Flows discharged from the Golf Course Rd. storm drain are assumed to contribute to the Cabezon system and are modeled as such. Later, the design implemented to manage these flows will be reviewed by SSCAFCA and the City of Rio Rancho.

Accommodating flows from the West Branch and the necessary crossing of Unser Boulevard requires additional design review in the future. The plan of the Cabezon Development is to extend the existing box culverts under Unit 12 and accommodate the Ultimate Condition flow rate (Figure 3). The existing crossing structure is undersized for Ultimate Conditions flow rates (BLWMP). Potential, this condition has been resolved by additional upstream detention in the West Branch watershed. It is understood that increasing the size of the existing structure under Unser Boulevard is not a priority for the City of SSCAFCA. This is an area for continuing coordination between, SSCAFCA, the City and the developer.

The Unser Boulevard crossing structure may be determined as a constraint to downstream channel capacity. This would require that flows be mitigated upstream. This same principle applies to the Gateway/Unser pond, described in the BLWMP as part of the Ultimate Conditions Model flow rate.

### **Modeling Results**

Table 1 shows land treatments adjustments made for off-site basins described in the BLWMP.

Table 2 shows land treatment applied to sub-basins within the Cabezon development, peak discharges and total runoff volumes resulting from the 100-year, 24-hour storm event. Of special note, is the percentage of Land Treatment D used for the roadway subbasins. The lower than usual percentage is used due to the additional ROW that will be acquired for open space. See roadway cross-sections provided in the Appendix.

Table 1. Black Arroyo Off-Site Basins with Adjusted Land Treatments

Sub-basin	Treatment (%)				Methodology/Notes
	A	B	C	D	
EAST BRANCH					
201	2	17	24	57	BLWMP
202	0	34	32	34	Exist. for D; BLWMP for B&C
205	0	34	32	34	DPM for D; BLWMP for B&C
204	0	34	32	34	Exist. for D; BLWMP for B&C
203	0	34	32	34	Exist. for D; BLWMP for B&C
214	0	34	33	33	Exist. for D; BLWMP for B&C
215	0	27	25	48	Exist. for D; BLWMP for B&C
217A	2	46	12	40	BLWMP
211	0	10	18	72	BLWMP
212	0	31	29	40	Exist. for D; BLWMP for B&C
216	0	34	33	33	Exist. for D; BLWMP for B&C
217B	2	57	10	31	BLWMP
WEST BRANCH					
101	17	16	17	50	BLWMP
102	26	23	22	29	BLWMP
103	20	19	22	39	BLWMP
104	11	20	23	46	BLWMP
105	0	37	38	25	Exist. for D; BLWMP for B&C
106A	21	18	23	38	BLWMP
106B	6	19	26	49	BLWMP
107	0	42	37	21	Exist. for D; BLWMP for B&C
108	0	34	33	33	Exist. for D; BLWMP for B&C
109	0	31	36	33	Exist. for D; BLWMP for B&C
110	0	35	32	33	Exist. for D; BLWMP for B&C
111	0	37	30	33	Exist. for D; BLWMP for B&C
112	0	36	31	33	Exist. for D; BLWMP for B&C
113	0	45	30	25	Exist. for D; BLWMP for B&C
114	0	42	33	25	Exist. for D; BLWMP for B&C
115	0	42	33	25	Exist. for D; BLWMP for B&C
116	2	18	19	61	BLWMP

Table 1. Black Arroyo Off-Site Basins with Adjusted Land Treatments (cont)

Sub-basin	Treatments (%)				Methodology/Notes
	A	B	C	D	
118	9	26	26	39	BLWMP
119	8	39	23	30	BLWMP
120	5	28	28	39	BLWMP
120.0/121	0	11	19	70	BLWMP
150	19	23	25	33	BLWMP
151	9	28	28	35	BLWMP
152	15	26	26	33	BLWMP
153	7	27	27	39	BLWMP
154	13	29	28	30	BLWMP
155	1	18	23	58	BLWMP
156	4	30	29	37	BLWMP
157	7	22	25	46	BLWMP
158	3	4	17	76	BLWMP
159	3	10	20	67	BLWMP
160	16	22	24	38	BLWMP
161	1	30	28	41	BLWMP
300	0	34	35	31	Exist. for D; BLWMP for B&C
310	0	29	30	41	Exist. for D; BLWMP for B&C
320	0	44	22	34	Exist. for D; BLWMP for B&C
330	0	30	36	34	Exist. for D; BLWMP for B&C
340	0	33	33	34	Exist. for D; BLWMP for B&C
350	0	0	15	85	BLWMP
360	0	27	16	57	BLWMP
400	0	50	50	0	BLWMP
410	0	35	31	34	Exist. for D; BLWMP for B&C
420	0	0	15	85	BLWMP
430	0	42	24	34	Exist. for D; BLWMP for B&C
440	0	39	27	34	Exist. for D; BLWMP for B&C

NOTES

1. "Exist." refers to the existing condition model produced for FEMA in 1994

Table 2. Cabezon Drainage Basins within Black Arroyo Watershed

Sub-basin	Acres	DUs/Acre	T <sub>p</sub>	Land Treatments				Q <sub>peak</sub> (cfs)	Volume (ac-ft)	Methodology/Notes
				A	B	C	D			
1	71.5	4	0.13	0	30	28	42	237	9.4	D per DPM; B & C per SSCAFCA
2	20.6	4	0.13	0	30	28	42	68	2.7	"
3	70.9	6	0.137	0	27.6	14.8	57.6	282	12.4	"
4	69.2	6	0.17	0	27.7	14.8	57.5	213	10.6	"
5	51.3	6	0.13	0	28.1	15.0	56.9	182	7.8	"
6	61.3	6	0.13	0	28.1	15.0	56.9	218	9.3	"
7	108.9	6	0.14	0	27.5	14.7	57.7	388	16.7	"
8	19	6	0.13	0	27.8	14.9	57.3	68	2.9	"
9	28.7	6	0.13	0	27.2	14.6	58.3	103	4.4	"
10	83.1	6	0.13	0	28.1	15.0	56.9	295	12.6	"
11	10	Commercial	0.13	0	0	15	85	42	2.0	SSCAFCA
12	10.3	Commercial	0.13	0	0	15	85	43	2.0	SSCAFCA
13	50.5	Commercial	0.13	0	0	15	85	212	10.0	SSCAFCA
14	58.2		0.14	0	10	10	80	226	10.9	Mix of residential and SSCAFCA approved for commercial
15	14.7		0.13	0	10	10	80	60	2.8	"
16	19.8	School	0.13	0	25	25	50	69	2.8	SSCAFCA
17	15	Park/Pond	0.13	0	85	0	15	37	1.2	SSCAFCA
18	5	Park/Pond	0.13	0	85	0	15	12	0.4	SSCAFCA
19	5	Park	0.13	0	85	0	15	12	0.4	SSCAFCA
20	5	Park	0.13	0	85	0	15	12	0.4	SSCAFCA
21	15	WWTP	0.13	0	10	10	80	61	2.8	Wastewater Treatment Plant
Off_1	11.5		0.13	2	21	25	52	40	1.7	BLWMP
Off_2	10.6		0.13	2	24	26	48	36	1.5	BLWMP
Off_3	21.7		0.13	2	24	26	48	74	3.0	BLWMP
Off_4	31.9		0.13	1	29	28	42	106	4.2	BLWMP
Off_5	16.3		0.13	3	20	25	52	57	2.4	BLWMP
Off_6	16.8		0.13	1	29	28	42	55	2.2	BLWMP
Off_7	6.8		0.13	1	29	28	42	22	0.9	BLWMP
Off_8	9.6		0.13	1	29	28	42	32	1.3	BLWMP
A_1	20.3	Arroyo/Channel	0.13	15	30	30	25	57	2.0	Based on arroyo cross-section
A_2	5.2	Arroyo/Channel	0.13	15	30	30	25	15	0.5	"
A_3	5.1	Arroyo/Channel	0.13	15	30	30	25	14	0.5	"
A_4	3.9	Arroyo/Channel	0.13	15	30	30	25	11	0.4	"
A_5	7.8	Arroyo/Channel	0.13	15	30	30	25	22	0.8	"
A_6	29.6	Arroyo/Channel	0.13	15	30	30	25	83	3.0	"
R_1	4.2	Roadway	0.13	0	5	29	66	16	0.7	Based on road way cross-section
R_2	4.3	Roadway	0.13	0	5	29	66	17	0.7	"
R_3	3.4	Roadway	0.13	0	5	29	66	13	0.6	"
R_4	6.4	Roadway	0.13	0	5	29	66	25	1.1	"
R_5	4.8	Roadway	0.13	0	5	29	66	19	0.8	"
R_6	3.5	Roadway	0.13	0	5	29	66	13	0.6	"
R_7	1.1	Roadway	0.13	0	5	29	66	4	0.2	"
R_8	7.6	Roadway	0.13	0	5	29	66	29	1.3	"
R_9	9.9	Roadway	0.13	0	5	29	66	38	1.7	"

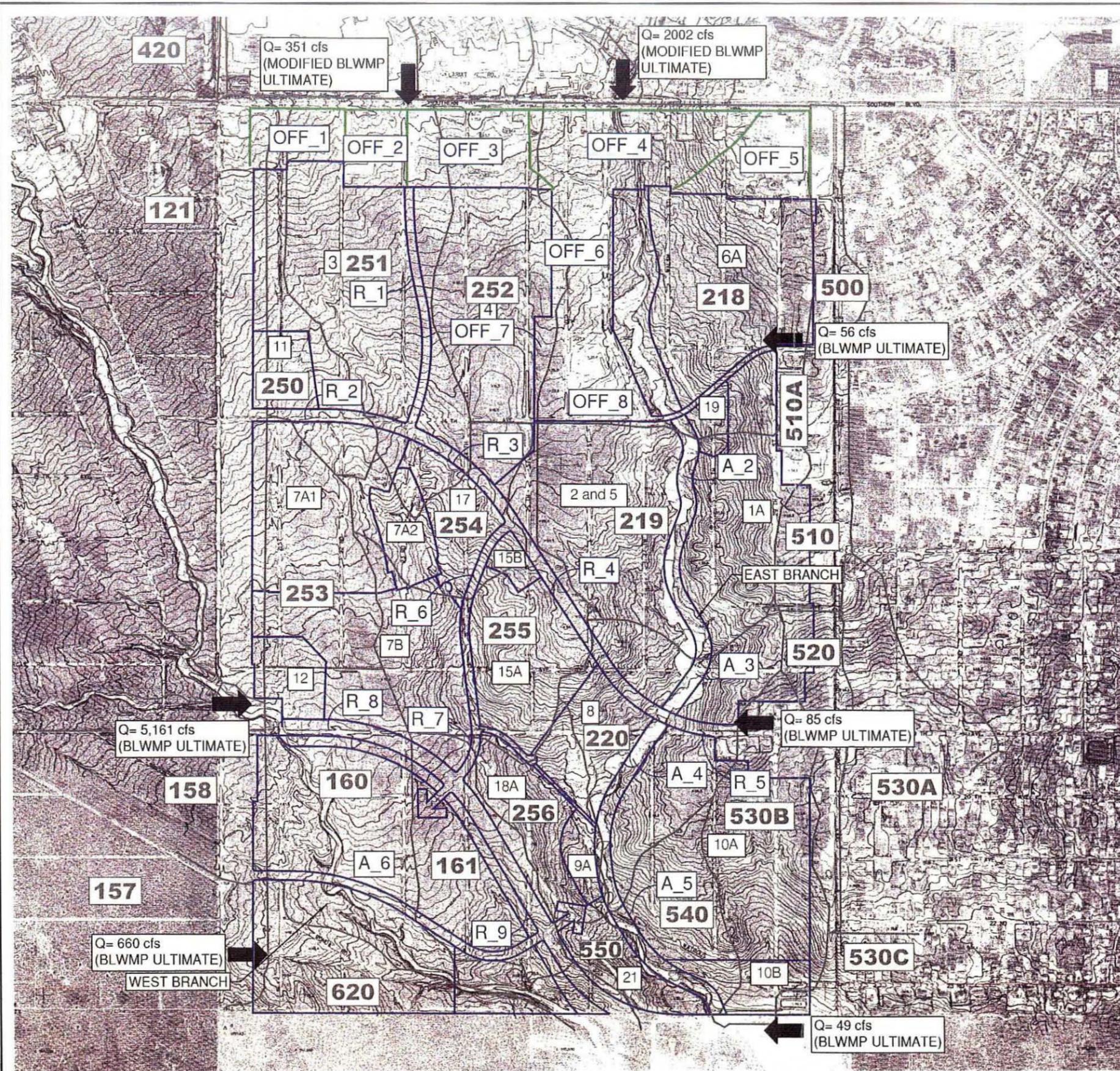
Several modeling scenarios were generated to assess affects of development on the capacity of the Black Dam in its ultimate build-out condition. One assessment excluded any water quality detention within the development and included only that detention deemed necessary for the most efficient system. A second approach included a 19.6 ac-ft water quality/sediment facility on the East Branch just south of Southern Boulevard. Figure 4 shows the routing schematic for basins as well as results at significant locations. Table 3 shows ultimate water surface elevations in the Black Dam based on these modeling scenarios with a comparison to the Ultimate condition model created in the BLWMP. With no water quality detention, the capacity of the Dam is not exceeded and the Ultimate Condition water surface elevation is lower than for the BLWMP Ultimate Conditions Model. The addition of the 19.6 ac-ft "first flush" facility reduces the water surface elevation further.

**Table 3 - Comparison of Water Surface Elevations at Black Dam (Future)**

<b>Emergency Spillway Elevation</b>	<b>5165.75</b>	<b>Remaining Storage Depth Prior to Overflow</b>
<b>MAX. WATER SURFACE ELEVATION for:</b>	<b>Elevation</b>	
	<b>(ft)</b>	<b>(ft)</b>
BLWMP Ultimate Condition Model	5164.41	1.35
Cabezon Model w/o WQ facilities	5163.97	1.78
Cabezon Model w 22 ac-ft WQ facility	5163.31	2.44

### **Channel Improvements**

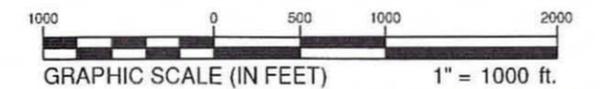
A field assessment of the arroyos within the Cabezon development show significant channel instability and, as stated above, the potential for significant sediment generation that is ultimately transported to the Black Dam. In addition, FEMA floodplains exist and are shown on Figure 5. In order to address this problem a stable composite channel section was developed and reviewed for general conceptual applicability by regulating agencies including SSCAFCA and the City of Rio Rancho Public Works director. Based on watershed improvements installed since the latest FEMA study and those proposed by the Cabezon Master Plan, a Letter of Map Revision (LOMR) is planned for submittal to revise floodplain mapping. In addition, a cooperative effort will be undertaken with SSCAFCA to extend the East Branch Channel up to Southern Boulevard. This will not only increase the hydraulic efficiency of the channel, but also address erosion problems just south of Southern Blvd..



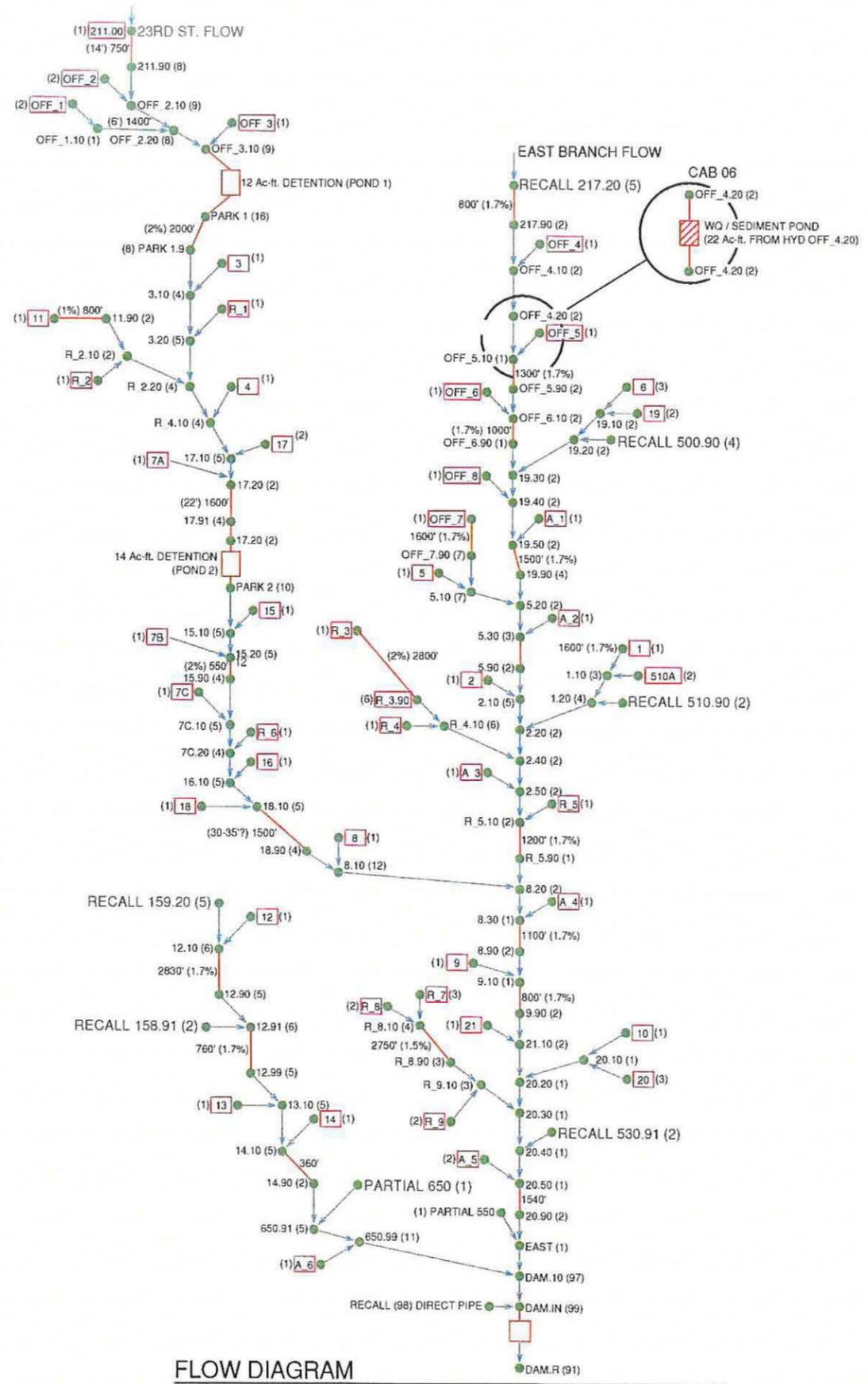
**LEGEND**

-  FLOW ARROW
- 252** EXISTING DRAINAGE BASIN LABELS (FROM BLWMP)
-  EXISTING DRAINAGE BASIN (FROM BLWMP)
-  CABEZON BASIN BOUNDARIES
- 16** CABEZON BASIN BOUNDARY LABELS
-  OFF-SITE DRAINAGE BASIN BOUNDARIES

NOTE: EXISTING BASINS TAKEN FROM ASCG BLACK ARROYO WATERSHED MANAGEMENT PLAN 2002



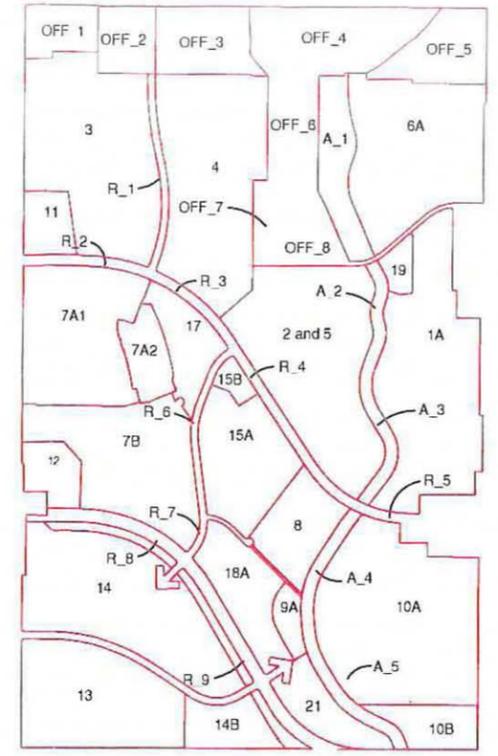
	<p>CITY OF RIO RANCHO</p> 
<p><b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021</p>	<p><b>FIGURE 3</b> CABEZON DRAINAGE MASTER PLAN</p> <p><b>BASIN COMPARISON &amp; OFF-SITE FLOWS</b></p>



**FLOW DIAGRAM**  
SCALE: N/A

**KEY POINTS**

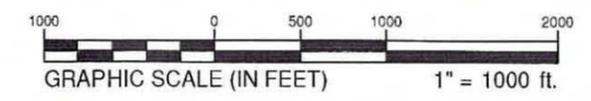
100 yr. - 24 hr.			
	HYD	Qpeak (cfs)	Volume (ac-ft)
Cab05	Off_3.10	478	26.2
	park1	98	26.2
	19.20	275	12.7
	217.90	2015	116.9
	Off_5.90	2126	123.5
	R_5.90	2869	171.9
	17.20	693	56.1
	park2	153	56.1
	18.10	510	74.3
	8.20	3270	249.1
	EAST	3654	292.2
	650.99	5301	337.8
	DAM.10	8670	630.1
	DIRECT.PIPE	1192	49.6
Cab06	Off_3.10	478	26.2
	park1	98	26.2
	19.20	275	12.7
	217.90	2015	116.9
	Off_5.90	2062	103.5
	R_5.90	2534	151.3
	17.20	693	56.1
	park2	153	56.1
	18.10	510	74.3
	8.20	2834	228.4
	EAST	3006	271.7
	650.99	5301	337.8
	DAM.10	7024	609.5
	DAM.IN	7491	659.0
DAM.R	2524	658.9	



**FLOW AREA KEY**

SCALE: NTS  
LEGEND

- ADD
- ROUTE
- COMPUTE HYD
- HYD FROM OUTSIDE
- HYD ID
- HYD NAME
- DETENTION BASIN
- WQ SEDIMENT BASIN

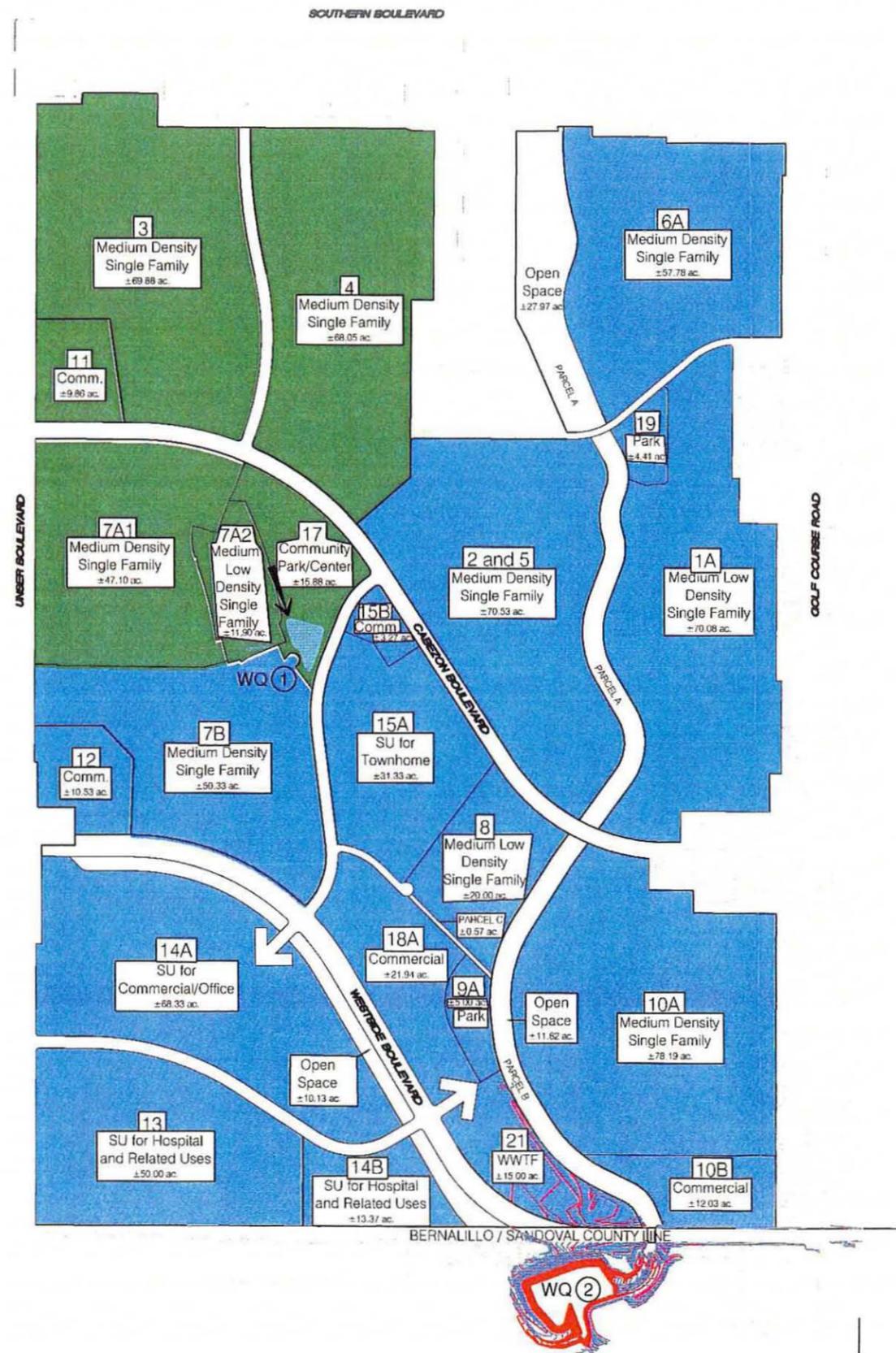


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**FIGURE 4**  
**CABEZON DRAINAGE**  
**MASTER PLAN**  
**DRAINAGE**  
**MODELING DIAGRAM**



Water Quality/Sediment Facilities

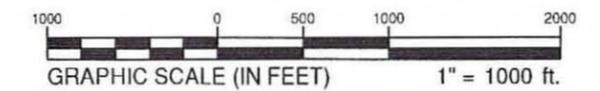
WQ Facility	Service Area	Total Area (sq. miles)	Total Area (acres)	Volume <sup>1</sup> (ac-ft)
1	Units 3,4,11,17, part of 7	0.347	221.8	±26.5
2	Units ,1,2,5,6,8,9,10,12,13,14, 15,18,19,21, part of 7	0.879	562.4	±25.0
<b>TOTAL #/VALUE</b>				

Notes:

1. Treatment Volume assuming the first 0.25" of runoff is considered the first flush
2. Does not include offsite area near school

LEGEND

- PROPOSED WQ / SEDIMENT FACILITIES
- WQ ①
- WQ ②
- WQ ① PROPOSED WQ / SEDIMENT FACILITIES NUMBER

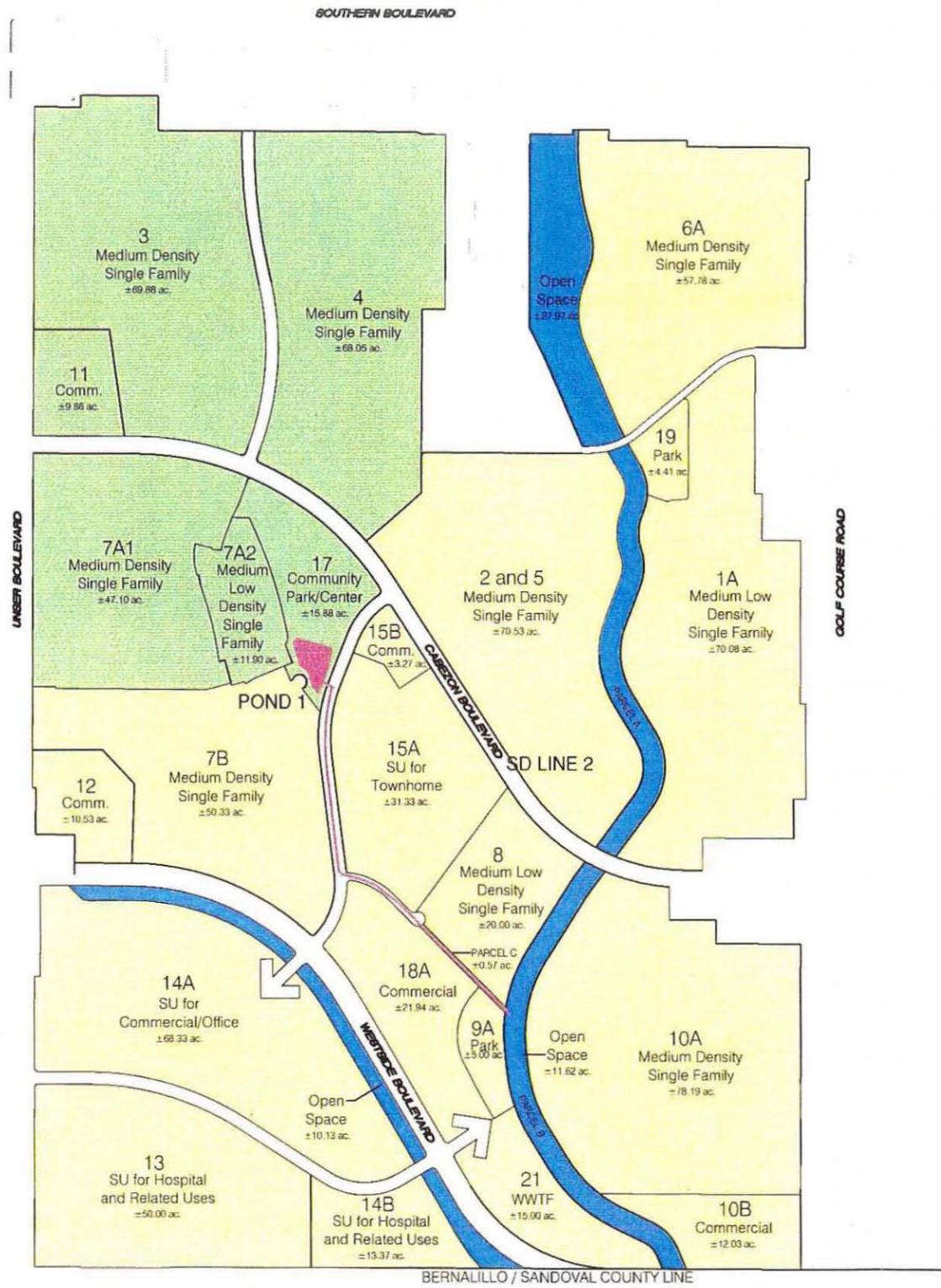


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FIGURE 7  
 CABEZON DRAINAGE  
 MASTER PLAN  
 PROPOSED WQ /  
 SEDIMENT FACILITES

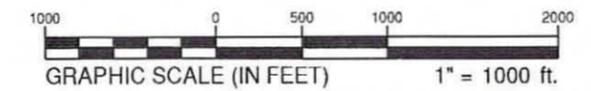


**LEGEND**

- PHASE 1
- PHASE 2
- STABILIZED CHANNEL
- PROPOSED DETENTION FACILITIES
- MAJOR BRANCH STORM DRAIN LINE

**MAJOR INFRASTRUCTURE PHASING**

- PHASE 1: PONDS 1 & 2, SD LINE 1, WATER QUALITY FACILITIES 2 & 14
- PHASE 2: CHANNEL, SD LINE 2, WATER QUALITY FACILITIES 1, 3, 5, 6, 7, & 12



	<p><b>CITY OF RIO RANCHO</b></p>	
<p><b>FIGURE 8 CABEZON DRAINAGE MASTER PLAN</b></p>		
<p><b>WILSON &amp; COMPANY</b> 2600 THE AMERICAN ROAD S.E. SUITE 100 RIO RANCHO, NEW MEXICO 87124 (505) 898-8021</p>	<p><b>PHASING DIAGRAM/ MAJOR INFRASTRUCTURE</b></p>	