

**Marketability Study of Sand, Gravel & Borrow Products  
for Three Sites Located in N. Metro Phoenix, AZ**



**MONTANDON FARLEY**  
RE-AD GROUP INC.  
REAL ESTATE ADVISORS & APPRAISERS

MARKETABILITY STUDY  
OF SAND, GRAVEL AND BORROW  
PRODUCTS FROM THREE SITES  
LOCATED ABOVE DAMS  
IN NORTH METROPOLITAN  
PHOENIX ARIZONA

PREPARED FOR

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION  
2901 WEST DURANGO STREET  
PHOENIX, ARIZONA 85009

ATTN: MR. JERALD BAILEY  
CHIEF REAL PROPERTY APPRAISER

EFFECTIVE DATE: OCTOBER 17, 1997

PREPARED BY

WENDELL L. MONTANDON, MAI

OF

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**MONTANDON FARLEY**  
RE-AD GROUP INC.  
REAL ESTATE ADVISORS & APPRAISERS

October 17, 1997

Maricopa County Department of Transportation  
2901 West Durango Street  
Phoenix, Arizona 85009

Attn: Mr. Jerald Bailey, Chief Real Property Appraiser

RE: Marketability study of sand, gravel and borrow products from three sites located upstream of dams in northern Metropolitan Phoenix area, Arizona

At your request, we have completed a narrative feasibility study regarding the marketability of borrow materials and sand and gravel products from three sites located upstream from dams in north Metropolitan Phoenix. The sites are located at the New River, Adobe and Cave Butte Dams. The function of this report is to assist The Flood Control District of Maricopa County in determining if there is a potential revenue source from sand, gravel or borrow production from the mining of the three areas.

The attached report contains data and discussions which are the results of our survey of the supply and demand for rock products in north Metropolitan Phoenix. The study includes specific assumptions regarding the quality, quantity and legality of mining the referenced sites. Our conclusions are based on an analysis of supply and demand factors relying heavily on interviews with operators of major processing facilities, the executive vice president of the Arizona Rock Products Association, the geologist with the Arizona Land Department in charge of leasing land to sand and gravel operators, and an independent geologist consultant for the construction aggregate industry, intimate with Metropolitan Phoenix sand and gravel supplies.

The sites are generally described in the attached report containing data and discussions from which, together with our experience as real estate market analysts, the conclusions were formed. This report has been prepared in accordance with the real estate/real property consulting guidelines of the Uniform Standards of Professional Appraisal Practice (USPAP) as established by the Appraisal Foundation, and the Standards of Professional Practice as defined by the Appraisal Institute.

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October 17, 1997

Page Two

This is a limited scope assignment to the extent that we have been asked to assume the following, which are made special predications for our conclusions:

- 1) The site has sufficient access to allow for the removal of material
- 2) The material is of marketable quality and will support a mining operation
- 3) Operations will be legal
- 4) The operator will have approximately one square mile in which to work

After considering all of the facts available to us, subject to the special predications and underlying assumptions contained herein we have concluded that a reasonable rate of production to be expected from the subject sites, as of October 17, 1997, are as follows:

New River Dam site	150,000 tons per year increasing as much as 10% per year
Adobe Dam site	350,000 tons per year
Cave Butte Dam site	450,000 tons per year

Sincerely,

  
Wendell L. Montandon, MAI  
Certified General Real Estate Appraiser  
Certificate Number 30159, State of Arizona

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## INTRODUCTION

### Purpose

The purpose of this report is to examine the marketability of sand, gravel and borrow products from three sites located upstream of dams in northern Metropolitan Phoenix, Arizona. The sites are located at the New River, Adobe and Cave Butte Dams as generally depicted on the Metropolitan Phoenix map on the next page.

### Function

The function of this report is too assist the Flood Control District of Maricopa County in determining if there is a potential revenue source from the mining of the three areas.

### Scope

This is a limited scope assignment to the extent that we have been asked to assume the following, which are made special predications for our conclusions:

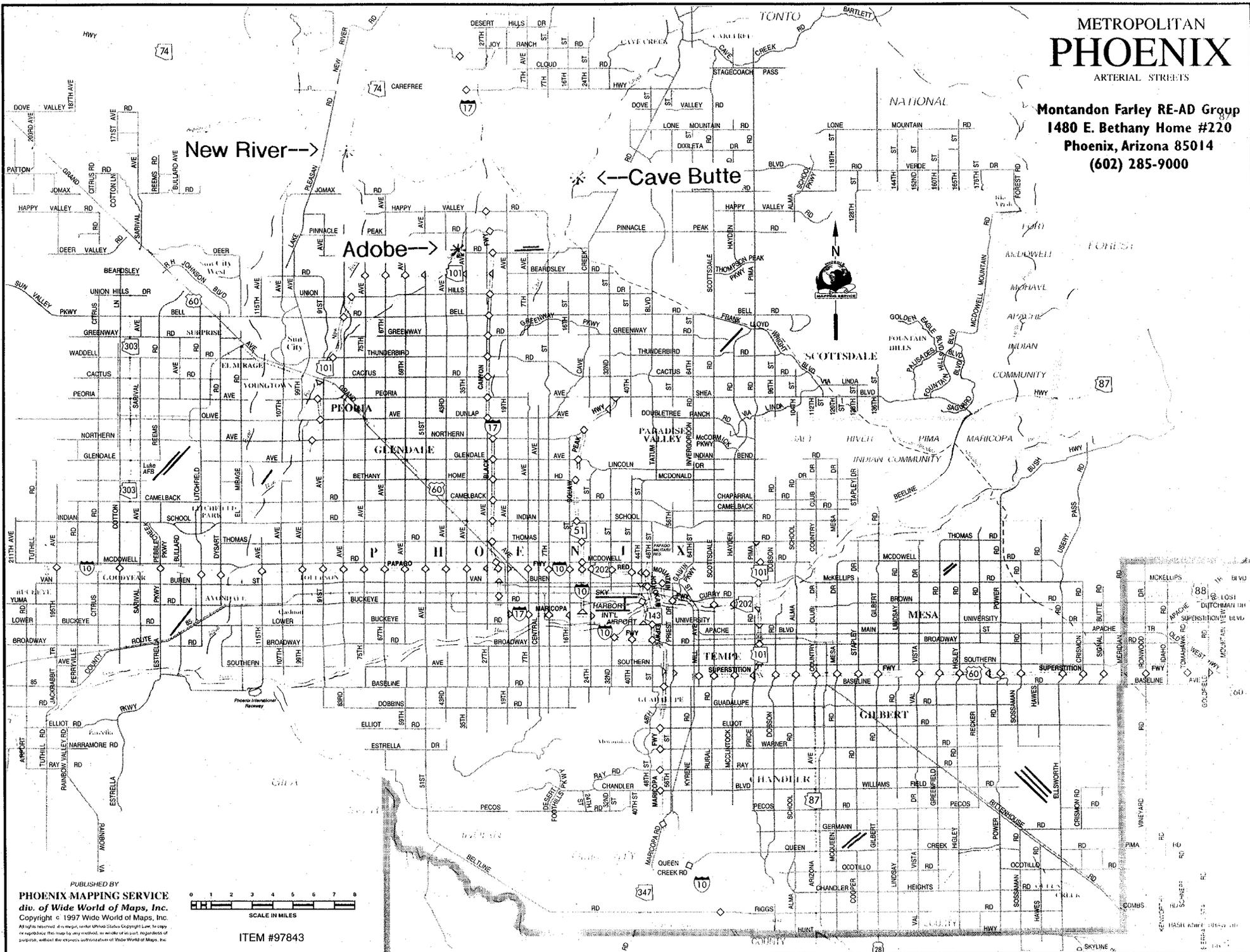
- 1) The site has sufficient access to allow for the removal of material
- 2) The material is of marketable quality and will support a mining operation
- 3) Operations will be legal
- 4) The operator will have approximately one square mile in which to work

The assignment is also limited in scope by the time allotted to complete our investigations. However, the degree of investigations accomplished were not so limited as to make the conclusions measurably less reliable than they would have been if time permitted more investigations and analyses. Several factors contribute to this conclusion. The rock product's industry members consider both their specific production and supply-and-demand quantities as privileged confidential information. The operations themselves can be very complex because of the variables in product quality, production cost, royalty cost, transportation cost and the long-term planning that might dictate the removal of materials from a leased site versus a fee simple-owned site for the purpose of preserving reserve material. Preservation may be a prevailing criteria when the supplies are located in the heart of an urban area where they are not likely to be readily replenished. And finally, the general availability of sand and gravel deposits in the Metropolitan Phoenix area and specifically the north valley area can typically meet the changes in demand without creating any sizable imbalances in the supply-and-demand equation, negating the reliability of a detailed quantitative supply-and-demand analysis.

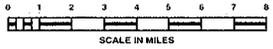
# METROPOLITAN PHOENIX

ARTERIAL STREETS

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ITEM #97843

The scope of this study included interviews with many parties involved in the rock product industry. Some of those interviewed include William R. Peck, Engineering and Environment, United Metro Materials, Inc.; John Fowler, President, United Metro Materials, Inc.; Joseph M. Crow, Geologist with Malpais Consulting of Quemado, New Mexico (consultant for the construction aggregate industry with an emphasis on Metropolitan Phoenix); Ken Quartermain, Executive Vice President, Arizona Rock Products Association; Lee Edmonson, Director of Real Estate Arizona-New Mexico, Cal Mat Company; Hugh Gilbert, Vice President, Wheeler Construction; Gary D. Slusher, Geologist (in charge of state land leases for sand and gravel operations), Arizona State Land Department; and Ken Phillips, Chief Engineer, Arizona Department of Mines and Mineral Resources.

Some of the resource materials considered included: *Mineral Industry Surveys* by the United States Department of the Interior for 1996 and other years, US Geologic Survey; *Impact of the Rock Products Industry on the Arizona Economy*, prepared by Economic Outlook Center, College of Business, Arizona State University, dated February 1997 for the Arizona Rock Products Association; *Land Use Plan, Maricopa County - New River*, dated June 1992; *General Plan for Phoenix, 1985-2000*, last revised June 1994; *Socioeconomic Projects, Interim Report*, by Maricopa County Association of Governments, dated June 1997; draft copy of the *MAG Transportation Improvement Program for Fiscal Years 1988-2002*, dated September 1997; *Peoria Comprehensive Master Plan*, April 1997; and the *1997 Arizona Directory of Active Mines*.

Based on our findings, expectations were formulated as to the relative marketability of each of the sites upstream from the three dams. This report has been prepared in accordance with the real estate/real property consulting guidelines of the Uniform Standards of Professional Appraisal Practice (USPAP) as established by the Appraisal Foundation, and the Standards of Professional Practice as defined by the Appraisal Institute.

## METROPOLITAN PHOENIX

The marketability of any form of real estate requires the consideration of the underlying economics and the demographic profile of the surrounding community. Potential demand for real estate is a product of the growth and stability of its environs. The following summary discussion of the demographic, economic, governmental and environmental forces acting on the Phoenix area is deemed an integral part of this analysis.

As a metropolitan area, Phoenix is synonymous with Maricopa County, one of the nation's largest and most populous counties.<sup>1</sup> Phoenix' growth represents most of the state's growth and economic vitality, accounting for 67% of the state's net in-migration in the 1980s and the 1990s through the first three quarters of 1997.

Rapid growth from migration hides the fact that many people leave the state. During the 1980s, net in-migration to Arizona totaled approximately 65,000, resulting from in-migration of roughly 190,000 and out-migration of approximately 125,000. Thus, for every three people who move to the state, two leave. The ratio exceeds 1.5 during economic booms but falls to less than 1.33 during recessions.

Arizona's in-migrants disproportionately come from the West and Midwest; people in the Mideast and Northeast more frequently move to the Southeast.<sup>2</sup>

Arizona industries that have grown much faster than the national average have been manufacturing, construction, finance, insurance and real estate. The government sector grew too, but paralleled growth of government employment nationally.

### Population

As of the second quarter of 1997<sup>3</sup>:

<u>Year</u>	<u>Maricopa</u>	<u>Arizona</u>
June 1997 Projection	2,721,761	4,595,379

---

<sup>1</sup> The Phoenix MSA (metropolitan statistical area) was synonymous with Maricopa County until 1993, when the federal government changed to the Phoenix-Mesa MSA, including Pinal County due to the encroachment of urbanized Phoenix into the Apache Junction area of Pinal County.

<sup>2</sup> *Population Estimates and Projections*, Arizona State University College of Business, Center for Business Research, Tempe, Arizona, January 1994, pp. 3-4.

<sup>3</sup> Department of Economic Security, Statistics Department

The short-term prospects for population growth call for a healthy rate of increase well above the national average. Growth in Maricopa County's population between 1990 and 1995 was stable at approximately 70,000 per year. Of this total, an average of about 47,000 are attributed to net migration. For 1996, population growth was 86,000 with 61,000 allocated to net migration.

Changes in population projections (in thousands) by the ASU Center for Business Research for the next four years are:

Mid-Year Projections	Total Changes				Net Migration Changes			
	Arizona	Maricopa	Pima	Balance	Arizona	Maricopa	Pima	Balance
1997	123	81	16	26	85	55	12	18
1998	117	77	16	24	81	52	12	17
1999	108	81	14	23	82	47	10	16
2000	97	63	12	22	71	39	9	15

### Economic Forces

The economic base of the Phoenix metropolitan area is relatively well diversified and is able to absorb changes in the economy due to its blend of high technology, manufacturing and service industries. The percentage of manufacturing jobs in Maricopa County dedicated to electronic components is over 20% compared to 3.0% nationally; and in aerospace, Maricopa County has over 10% compared to 3.6% nationally. Maricopa County also has a relatively high percentage of jobs in eating and drinking places, each of which is tied to the region's tourism.

Credit card processing has become a major metropolitan Phoenix industry. Arizona passed a bill in 1989 deregulating the state's credit card industry. Rates and fees, on credit cards based here, are established by the market. There are no artificial fee or price constraints. Arizona is believed to have at least 7,000 credit card jobs involving seven credit card issuers, many of which have been created in the past few years. This compares to approximately 20,000 credit card jobs in California. Besides having regulations that allow for a market driven, credit card fee structure, Arizona's cost of living and operating cost are much lower than California's.

However, the credit card industry is not the only source of Phoenix' job growth. Arizona, and specifically metropolitan Phoenix, has recently experienced a revival of its reputation as a "silicone desert," a takeoff on California's famous silicone valley. Some of the mid-1990 events that have occurred that lead to this conclusion include the following:

- Intel Corporation's construction of a \$1.3 billion state-of-the-art computer chip factory in Chandler
- SGS-Thomson Microelectronics manufacturing a new line of micro-processors in north Phoenix in a 280,000-square-foot facility at 10th Street and Bell Road
- Motorola Inc.'s plans to expand its 4,000 employee semiconductor factory in Mesa
- Microchip Technology, Inc.'s expansion
- Sumitomo, a Japanese conglomerate in the silicon-wafer manufacturing industry, construction of a one-billion-dollar manufacturing plant in North Phoenix

A factor that is not revealed by total employment figures is Maricopa County's limited number of corporate headquarters. Very few of the region's major private sector employers, particularly in manufacturing and business/financial services, are headquartered in Arizona. Instead, it has been considered a good location for regional or branch operations.

Diversification of employment is the key to the economy of the Phoenix area, although the economy is in a transition from manufacturing to a more service-oriented base.

#### *Job Growth*

Phoenix-Mesa was third nationally for 1996 in terms of new job growth. With 69,000 new jobs created, it finished behind Los Angeles with 94,500 and Seattle with 73,400. As of February 1997, the Phoenix-Mesa area ranked second with 79,600 new jobs created over the prior 12-month period.

### *Unemployment*

Metropolitan Phoenix has traditionally followed national trends in unemployment in terms of direction, but not with the same severity. Both the Phoenix and the national rates have declined significantly from their 1982 highs. The Phoenix area recovered much faster through 1984. However, beginning in the last half of 1991 and continuing through the first half of 1992, unemployment in Metropolitan Phoenix increased to its highest level since 1983. The increase, while following a nationwide trend, exceeded the nation's rate of change. Improvement in the unemployment rate through 1996 was better than the national average as illustrated below.

<u>Year</u>	<u>Metro Phoenix</u>	<u>Arizona</u>	<u>U.S.A.</u>
1995	3.5	5.1	5.6
1996	3.5	5.1	5.4

Source: Arizona Department of Economic Security and the Economic Outlook Center, Arizona State University

### *Standard of Living*

The standard of living is a comparison of the cost of living relative to income levels in an area. Housing costs, a significant component of the total cost of living are a similar proportion to income in Phoenix as they are nationally. The national average ratio of median home value to median household income was 2.6 in the 1990 Census. In Phoenix, it was 2.7. As a result, the standard of living for Phoenix residents, at least in terms of housing, is considered close to normal.

### *Governmental Forces*

The city of Phoenix government is a city council form, with a mayor and a city manager. This form is the most common among the larger communities in the metropolitan area.

Most of the major issues facing Metropolitan Phoenix city governments relate to problems caused by rapid growth, such as: air and ground water pollution, freeway construction, annexations and urban sprawl, preserving residential neighborhoods, ensuring an adequate water supply, flood control and mass transit alternatives.

For a city that developed around the automobile, Phoenix has relatively few freeway miles per capita. In 1985, voters approved a half-cent sales tax increase for the purpose of acquiring right-of-way and constructing freeways in a 231-mile system to loop and cross the metropolitan Phoenix area. Although most of the vital portions of the system were scheduled for completion by 1995, some sections are not planned for completion until 2005 due to cost overruns and less revenue than projected.

### *Natural Resources*

National forests and some of the country's largest county and city parks and preserves provide an abundance of outdoor activities. Most of metropolitan Phoenix' growth, as well as its tourist industry, is attributable to its climate, scenery and recreational opportunities. Water sports, at several man-made lakes, and snow skiing are available within a several hour drive.

The Phoenix area is characterized by a dry climate with a wide range between minimum and maximum temperatures. June and July are the hottest months with an average maximum temperature of 106.4°F. December is the coldest month with an average minimum temperature of 42.8°F. February and March provide the most ideal temperatures and are the peak tourist months. The average annual minimum temperature is 63.1°F while the average maximum temperature is 86.9°F. Annual precipitation averages 8.4 inches.

Water is a precious commodity in the desert, but Phoenix has sufficient supplies to support its continued growth. As more agriculture is eliminated, the net demand for water decreases even with the burgeoning growth in population. One acre of typical residential growth requires about one-third of the water of one acre of agricultural land.

### *Summary*

The area's mild winter climate, proximity to several major southwest cities, and the area's availability of water and developable land has enabled the Phoenix area to become one of the fastest growing metropolitan areas in the country. The economy is relatively diverse, relying primarily on service, trade, manufacturing and government sectors as major employers. After experiencing a virtual real estate depression in the late 1980s and early 1990s, metropolitan Phoenix has mostly recovered from one of the wildest 15-year real estate cycles in history. Although near its peak in this economic cycle, the lack of excess supply and excess amounts in the pipeline suggest any near-term downturn truly will be different. In fact, most sectors, to be briefly summarized next, are in equilibrium or experiencing shortages.

## Retail

Retail markets generally follow the housing cycle and, therefore, have been strong with vacancy rates at the end of 1996 about 8%. After almost 3.8 million square feet of construction in 1996, another 2.7 million square feet is anticipated for 1997 and 2.3 million square feet for 1998. Although construction activity continues at a rapid pace, most of the space is pre-leased with no major overbuilding anticipated.

## Office

Vacancy rates continued to decline to less than 12% at the end of 1996 after over a decade of 20% levels that ended in 1993. The first new speculative activity in seven years started in 1996 and can be expected to continue for at least several years without any obvious threat of overbuilding at this time, except perhaps in north Scottsdale. Rents should hold firm or increase in most markets. Rents in the better markets (Scottsdale and East Camelback) are now near the preconcession levels quoted at their 1980's peak. About 1.2 million square feet is expected to be added to supply in 1997 and perhaps 2 million square feet will be added in 1998. Without considering back office space absorption, in excess of 1 million square feet is expected in 1997. Koll reports actual absorption for the first half of the year at approximately 309,000 square feet.

## Industrial

Vacancy rates in the industrial market were less than 10% according to virtually all industrial surveys as of the end of 1996 and are expected to be lower by the end of 1997. According to Lee & Associates, about 15 million square feet of industrial space has been built in the Phoenix area over the past three years. An additional 6.6 million square feet of space is anticipated in 1997 and 2.3 million square feet for 1998. Vacancy rates are highest in research and development and lowest in manufacturing. Construction and absorption are expected to remain strong in these markets. Back office demand will continue to create a large segment of the industrial activity.

### Single-Family

Single-family permit activity has increased steadily over the past 6½ years, from 10,633 units in 1990 to a near record level of 27,985 units in 1996 (exceeded only by 1978, when 28,851 units were issued). The Blue Chip Consensus Forecast for 1997 predicted that single-family development was past its peak and would decline 12.5% to about 25,500 permits and another 10% decline to just over 22,000 units in 1998. However, activity for the first half of 1997 has remained at a near record pace as 14,421 permits were issued through June 1997. We expect the current trend to continue as both employment and population growth are strong; however, a slight slowdown is likely in the near future.

### Multi-Family

The Blue Chip Consensus Forecast is also suggesting multi-family development is probably past its peak with 8,545 permits in 1996; forecasters expect 7,200 apartment permits in 1997 and 6,300 in 1998. A total of 3,034 units were permitted in the first half of 1997. Overall vacancies are expected to hold near 6%. Class B rents will probably increase about 5% in 1997, while Class A properties will be concentrating more on maintaining occupancies than increasing rents. Absorption of about 6,000 units is projected for 1997.

### Roads

Over the next five years, the various local and state governments are budgeting about \$2.2 billion for road construction throughout Metropolitan Phoenix. These expenditures, as set forth in the Maricopa County Association of Governments (MAG) Transportation Improvement Program (Draft September 1997), are set forth by year, as follows:

1998	\$639,928,118
1999	454,259,386
2000	381,827,267
2001	281,405,942
2002	415,045,352

### Conclusion

Finally, the outlook for the individual real estate sectors and the economy as a whole for metropolitan Phoenix remains bright and considerably different than past cycle peaks when induced oversupply created significant dips before recovering. Nevertheless, some decline in demand over the next five years is a realistic expectation from the recent peaks.

## NORTH VALLEY AREA

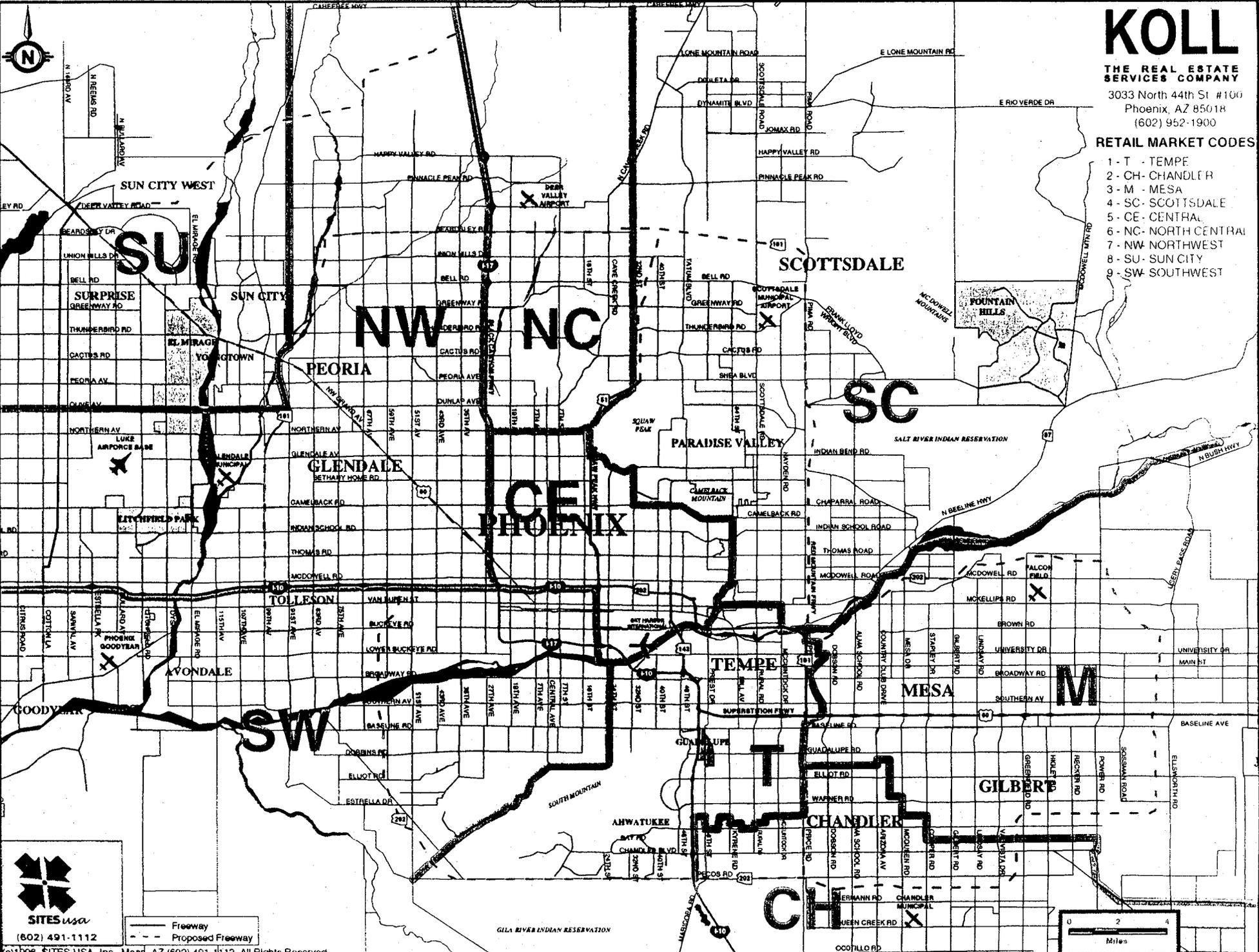
Marketability of sand, gravel and borrow products at the subject sites will be primarily dependant upon the growth of the North Valley Area. Transportation costs can be one of the largest portions of the cost of producing and delivering rock product to its ultimate destination. With this sensitivity in mind, we have considered the North Valley growth for all production types with emphasis on residential activity, since it will ultimately drive the other uses. Retail, office and industrial uses will be considered first.

### Retail

The North Valley market that most directly influences the subject, no more than about 15 miles from the subject sites, is defined by Koll, The Real Estate Services Company, as North Central, the northern portions of Scottsdale and the north portion of northwest Phoenix. Without dividing the Scottsdale and northwest Phoenix markets, we have considered the inventory, absorption and market share for each area in the following table.

Year	Metropolitan Phoenix Inventory	NC, Scottsdale, NW Phoenix	% of Metropolitan Inventory	Metropolitan Absorption	District Absorption	% of Metropolitan Absorption
1996	80,248,460	40,044,219	49.90	2,954,174	1,953,276	66.12
1 <sup>st</sup> ½ 1997	81,138,625	40,185,102	49.53	1,239,987	225,154	18.16
Planned UC	3,048,605	1,106,385	36.29			
Source: Koll						

A slightly below market share of new retail space is currently planned for the North Valley.



# KOLL

THE REAL ESTATE SERVICES COMPANY

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(602) 952-1900

## RETAIL MARKET CODES

- 1 - T - TEMPE
- 2 - CH - CHANDLER
- 3 - M - MESA
- 4 - SC - SCOTTSDALE
- 5 - CE - CENTRAL
- 6 - NC - NORTH CENTRAL
- 7 - NW - NORTHWEST
- 8 - SU - SUN CITY
- 9 - SW - SOUTHWEST



**SITES USA**  
(602) 491-1112

— Freeway  
- - - Proposed Freeway

Office

The North Valley market that most directly influences the subject is defined by Koll as North Central, Northwest, and Scottsdale. Without dividing the Scottsdale and northwest Phoenix markets, we have considered the inventory, absorption and market share for each area in the following table.

Year	Metropolitan Phoenix Inventory	NC, Scottsdale, NW Phoenix	% of Metropolitan Inventory	Metropolitan Absorption	District Absorption	% of Metropolitan Absorption
1996	44,937,919	12,737,607	28.34	873,697	295,580	33.83
1 <sup>st</sup> ½ 1997	46,718,394	14,093,165	30.17	308,825	7,763	2.51
Planned UC	1,713,032	892,738	52.11			

Source: Koll

An above market share of new office construction is projected. Most of this space is in Scottsdale and probably too far south to be served by the subject locations.

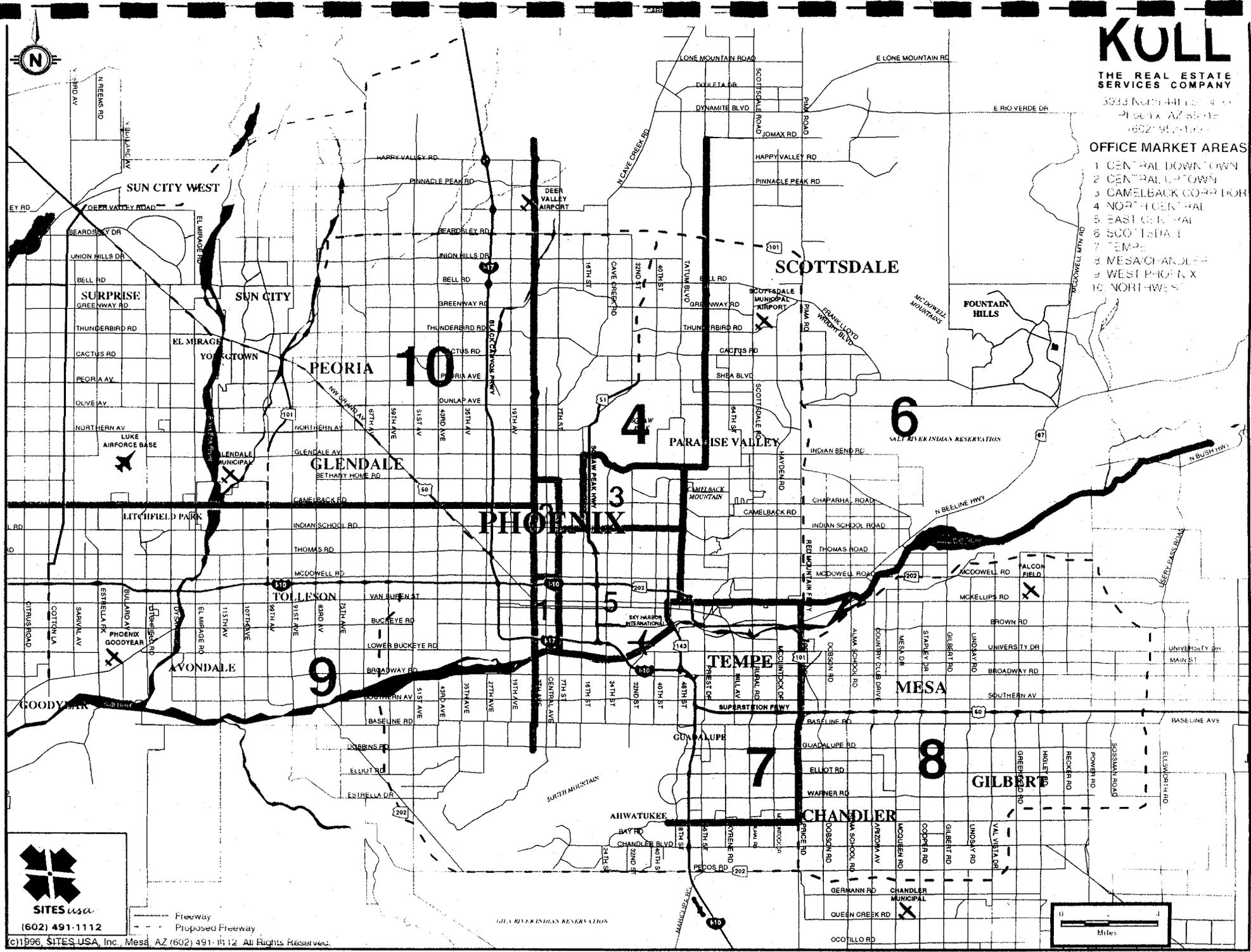
# KULL

THE REAL ESTATE SERVICES COMPANY

3933 North 44th Street  
Phoenix, AZ 85018  
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## OFFICE MARKET AREAS

- 1 CENTRAL DOWNTOWN
- 2 CENTRAL UPTOWN
- 3 CAMELBACK CORRIDOR
- 4 NORTH CENTRAL
- 5 EAST CENTRAL
- 6 SCOTTSDALE
- 7 TEMPE
- 8 MESA/CHANDLER
- 9 WEST PHOENIX
- 10 NORTHWEST



(602) 491-1112

Freeway  
Proposed Freeway

Industrial

The North Valley market that most directly influences the subject is defined by Koll as North East, Black Canyon, Northwest, and Scottsdale. Without dividing the Scottsdale and northwest Phoenix markets, we have considered the inventory, absorption and market share for each area in the following table.

Year	Metropolitan Phoenix Inventory	NE, BC, NW Phoenix, Scottsdale	% of Metropolitan Inventory	Metropolitan Absorption	District Absorption	% of Metropolitan Absorption
1996	87,649,416	15,022,610	17.14	5,451,237	718,379	13.18
1 <sup>st</sup> ½ 1997	89,414,198	9,220,190	10.31	1,328,858	204,245	15.37
Planned UC	1,732,578	302,110	17.44			

Source: Koll

The industrial market share for the North Valley is indicated to be keeping pace with the existing inventory.

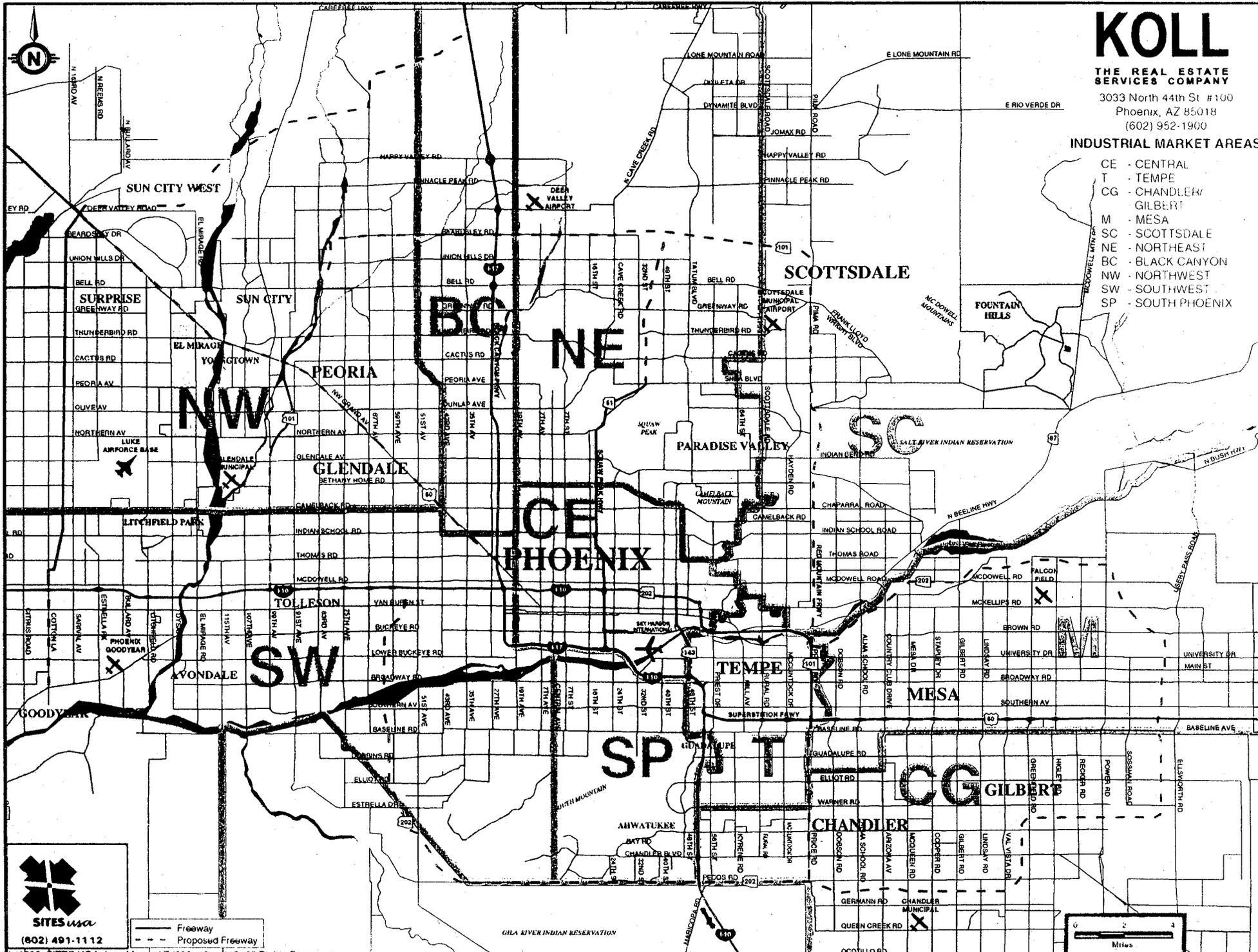
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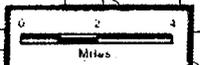
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## INDUSTRIAL MARKET AREAS

- CE - CENTRAL
- T - TEMPE
- CG - CHANDLER/ GILBERT
- M - MESA
- SC - SCOTTSDALE
- NE - NORTHEAST
- BC - BLACK CANYON
- NW - NORTHWEST
- SW - SOUTHWEST
- SP - SOUTH PHOENIX



— Freeway  
- - - Proposed Freeway



## Residential

There are a number of major North Valley projects that will impact the marketability of the potential sand, gravel and borrow deposits under consideration herein. Some of the larger projects are considered under the following subheadings.

### *Peoria Projects*

Fulton Homes is planning to develop 2,086 units north of Union Hills Road, to Deer Valley Road, between 75<sup>th</sup> and 83<sup>rd</sup> Avenues, in a community to be called Fletcher Heights.

Immediately west of the Fletcher Heights project is the Camino A. Lago, a 3,800-unit project planned by the state of Arizona in the area south of Pinnacle Peak Road, almost to Beardsley Road, and between 91<sup>st</sup> and 107<sup>th</sup> Avenues. Terramar is a community planned for 1,477 units located west of 67<sup>th</sup> Avenue between Jomax and Happy Valley Roads. No builder has yet committed to this site.

At 91<sup>st</sup> Avenue and Jomax Road, UDC is planning West Wing Ranch, and at Jomax Road, east of 67<sup>th</sup> Avenue Lakeland Village is planned; however, they are reportedly having water problems. Finally, Lake Pleasant Heights has five golf courses planned for the area south of Lake Pleasant. A comprehensive master plan map showing the location of the New River Dam is on the follow page.

### *North Phoenix and North Scottsdale*

#### Villages At Desert Hills:

The Dell Webb Corporation has been planning a large master planned community tentatively known as The Villages at Desert Hills, to be located on a 5,661-acre site on the east side of Interstate 17, just north of Desert Hills Drive, seven to eight miles north of the New River and Cave Butte Dam sites, and about 10 miles north of the Adobe Dam site, which has a more direct route and closer distance via the Black Canyon Freeway. The community is planned for 14,500 homes and projected to sell out over 15 to 20 years at a rate ranging from an average of just over 700 to nearly 1,000 homes per year. The project is currently in the design phase. Preliminary infrastructure is hoped to be started in the spring of 1998, with model homes ready in mid-1998. Prior to construction, a ductal water pipe needs to be constructed from Wadell Dam, seven miles west of the project. This construction is expected to take almost six months beginning in December of 1997 and require a partial import base to fill a 4' x 6' opening. The major portion of the first phase infrastructure is scheduled to begin in the spring.



## North Black Canyon Corridor:

A six-mile north/south stretch along the east side of Black Canyon Highway from Cloud Road on the north (one mile of Carefree Highway) to Jomax Road on the south and extending east to 19<sup>th</sup> Avenue and in some areas to 7<sup>th</sup> Avenue is an area designated by the city of Phoenix as having planned community development potential. An exhibit illustrating the area, relative to the subject parcels is included on the following page.

The North Black Canyon/Interstate 17 Corridor Concept Plan, dated September 10, 1997, proposes the development of a new, high-quality regional employment center. As a regional employment center, the corridor will play a major role in expanding the city's economic base and is proposed to take on a new urban form. The intent of the concept plan is to promote a new growth pattern with a sense of community, a sustainable transportation system and a high-quality development which both integrates and preserves natural desert environment. Unlike development that has occurred valleywide in the last 30 years, development in this corridor cannot rely on incremental expansion of existing water, sewer and street systems. A new water treatment plant with major gravity flow distribution lines and a new waste water reclamation plant need to be built. The only existing transportation facilities in the corridor are Interstate 17 and Carefree Highway. Several new arterials and transit facilities will be needed. The timing of the development is tied into the ability to comprehensively plan and finance this infrastructure. The concept plan proposes coordinating private development interests in the corridor with the city's strategic goals to insure timely and financially sound sequencing of infrastructure expansion.

Currently over 90% of the land area within the corridor is undeveloped sonoran desert. This provides an opportunity to integrate an urban environment with a unique desert preserve, similar in scale with South Mountain.

Currently about 80% of the land in the corridor is owned by the Arizona Land Department. Most of the private ownership is concentrated in a north/south linear pattern along Interstate 17.

In summary, the goals of the plan are to

- ✓ Promote the North Black Canyon corridor as a regional employment center, but not at the expense of growth within the existing city.
- ✓ Achieve a balance between employment and housing
- ✓ Concentrate growth within a defined corridor
- ✓ Preserve north sonoran desert amenities, to help define community form and identity



One of the significant properties within this concept plan is Community Southwest, which concerns a large acreage at the northeast quadrant of the Black Canyon Freeway and the Carefree Highway. A November 1997 hearing is planned for what is proposed to be 3,300 housing units. The actual start of development is expected to be another two years away.

At the south end of the corridor is a large acreage controlled by Vanguard Properties. Another 3,300 housing units are planned for this development. Development is probably five years in the future.

#### Tatum Ranch:

Tatum Ranch, originally master-planned by American Continental in the mid-1980s, represents the first in-line housing project in the Desert Foothills area. The success of the project has resulted in the planning and ongoing development of additional communities to include Tatum Highlands and Desert Ridge. These master-planned communities and additional subdivision activity are in varying stages of development in the Desert Hills area. The 1,400-acre Tatum Ranch community is located along both sides of Tatum Boulevard between Lone Mountain Road and Dynamite Boulevard. The project is zoned for 4,400 units (1,015 acres are allocated to single-family development and 75 acres to multi-family uses), for an overall density of 3.11 units per acre. Approximately 85% of the single-family land in Tatum Ranch is presently developed.

#### Tatum Highlands:

This 400-acre master-planned project is located on the west side of Tatum Boulevard on the north and south sides of Jomax Road. Construction in Tatum Highlands began in the fall of 1993, and reportedly the first home sold in the project in December 1993. Total potential remaining lot supply is just over two years.

#### Desert Ridge:

In 1989, Northeast Phoenix Partners was awarded a planning permit by the state of Arizona for 5,700 acres of state owned land bounded roughly by the CAP canal on the south, Pinnacle Peak Road on the north, 32nd Street on the west and 64th Street on the east. In June 1993, the state of Arizona marketed the first phase of Desert Ridge via two public auctions. The Phase 1 acreage, along with an additional 21.1 acres were plotted with 1,532 single-family residential lots and are nearly sold out. An additional 409 lots are being developed.

Dove Valley Ranch:

Dove Valley Ranch is a proposed, 500-acre residential community generally located on the south side of the Carefree Highway just east of the 40<sup>th</sup> Street alignment and west of Cave Creek Road. The allowed density is 1.4 to 1.7 dwelling units per acre. Only initial portions have been developed to date. A golf course is also planned.

Estancia:

Estancia is a newly-developed master planned development between the 96<sup>th</sup> and 104<sup>th</sup> Street alignments, south of Dynamite Boulevard and north of the Jomax Road alignment.

The community consists of 659 gross acres and includes a private championship golf course and country club, approximately 350 homes on lots ranging from one-quarter to one-half acre, a 160-acre park, and 340 acres of desert preserve. The desert preserve encompasses Pinnacle Peak, a readily identifiable landmark in north Scottsdale, which reportedly will be improved with a two and one-half mile public hiking trail.

Construction has been completed for the golf course portion, and custom lot sales have reportedly averaged close to 10 lots per month since it opened in mid-1995.

DC Ranch:

DC Ranch is presently under construction east of Pima Road, generally along the new alignment for Thompson Peak Parkway.

Phase I of the master plan includes approximately 1,237 acres and comprises a full range of land uses from retail, commercial, park, open space, resort and church to a golf course, all intermingled with a full spectrum of residential neighborhoods.

The golf course is expected to open in 1997, and the community's first residents have recently arrived. In total, DC Ranch encompasses approximately 8,300 acres and nearly 13 square miles of high Sonoran Desert, including three of the McDowell Mountains' highest peaks.

McDowell Mountain Ranch:

McDowell Mountain Ranch is being developed by Newhall Land and Farming Company. It is a 3,200-acre property bound by Bell Road on the north, 100<sup>th</sup> Street on the west, 124<sup>th</sup> Street on the east and Thunderbird/Cactus roads on the south.

The master plan calls for 3,893 single-family residences, 582 multifamily units, a 30-acre commercial corner, a 10-acre office tract and two neighborhood centers. A resort is planned; however, because the community will not include a golf course, any resort would likely be specialty in nature in an effort to make up for its lack of a golf course,

McDowell Mountain Ranch has been designed to feature an inordinate amount of open space, with roughly 50% of the site left in its natural state. A community path system will provide a four-mile loop trail for hikers and bicyclists, and the two major washes traversing the area will be designed as public access trails for equestrians.

The project will also feature a 64-acre community park, as well as middle and elementary schools.

Desert Mountain:

The master plan, as approved, for Desert Mountain provides for approximately 6,035 residential units, including resort units, and five, 18-hole golf courses. Approximately 100 acres of the property adjacent to Cave Creek Road, about one and one-half miles east of the Desert Mountain Parkway entrance, have been zoned for 250,000 square feet of office development and 500,000 square feet of retail, commercial and community service. Zoning has been obtained for additional commercial, office and community services at the southwest corner of Desert Mountain.

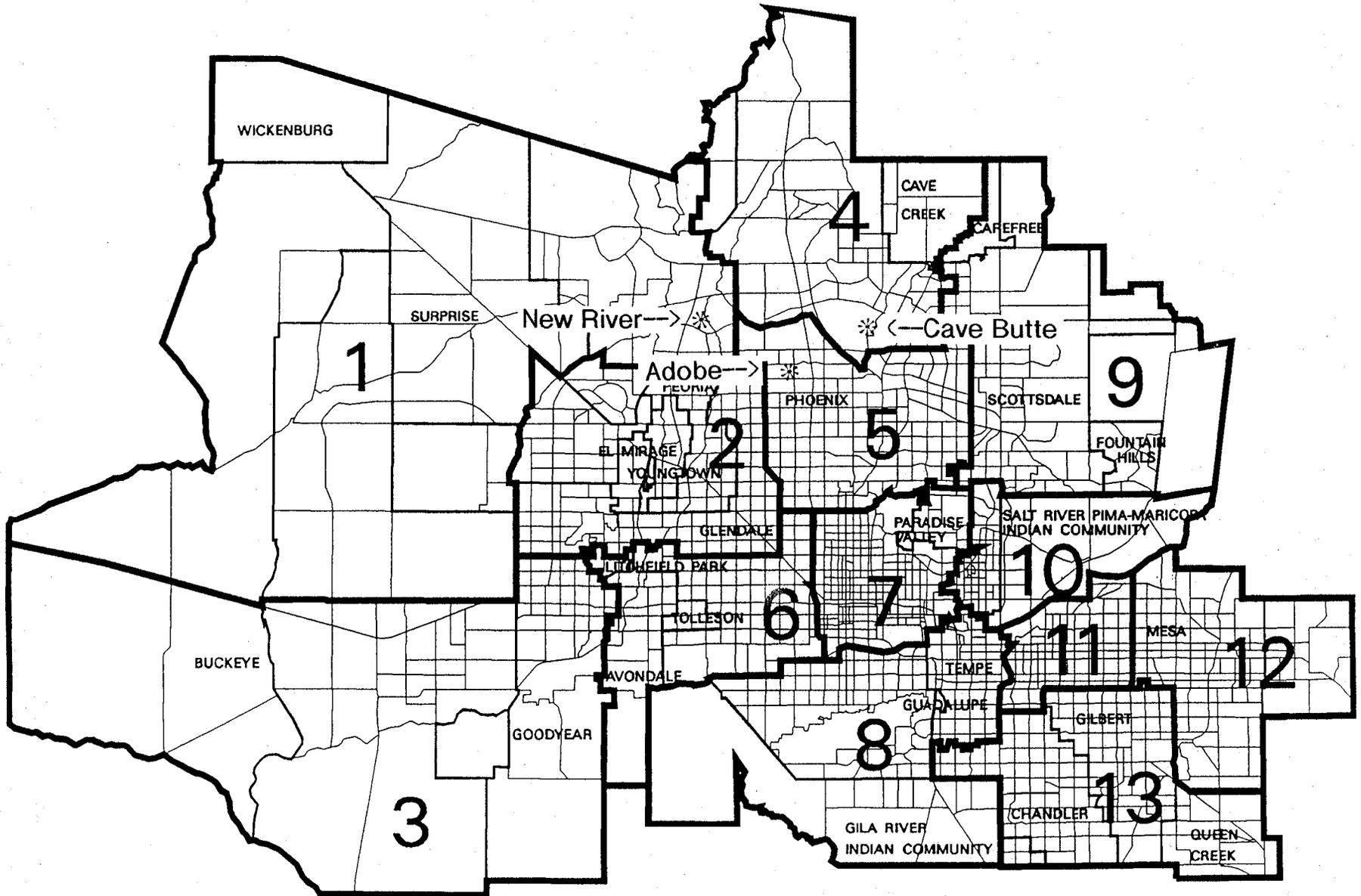
Three 18-hole, championship golf courses within the community have been designed personally by Jack Nicklaus to provide a wide and varied range of golfing experiences in a serene and natural setting. The Cochise course is the site of The Tradition, a major PGA Senior Tour event, which has received national television coverage.

On the following page is a portion of the General Plan for Phoenix 1985-2000 with the two easterly most sites highlighted.



MAG (September 1997 Study)

The Maricopa County Association of Governments has recently completed a *Socioeconomic Projection Interim Report June of 1997* for the years 1995 through 2020 for all of Maricopa County. Their accompanying narrative is not expected to be completed until late 1997. We have isolated the Regional Area Zones that are believed to have a potential impact on the subject sites and presented a map, table and both number and percentage increases graphical analyses of same, relative to all of Metropolitan Phoenix, on the following four pages.



MAG Regional Analysis/Traffic Analysis Zones  
**SECTION KEY MAP**

—— Municipal Planning Area Boundary  
 —— TAZ Boundary



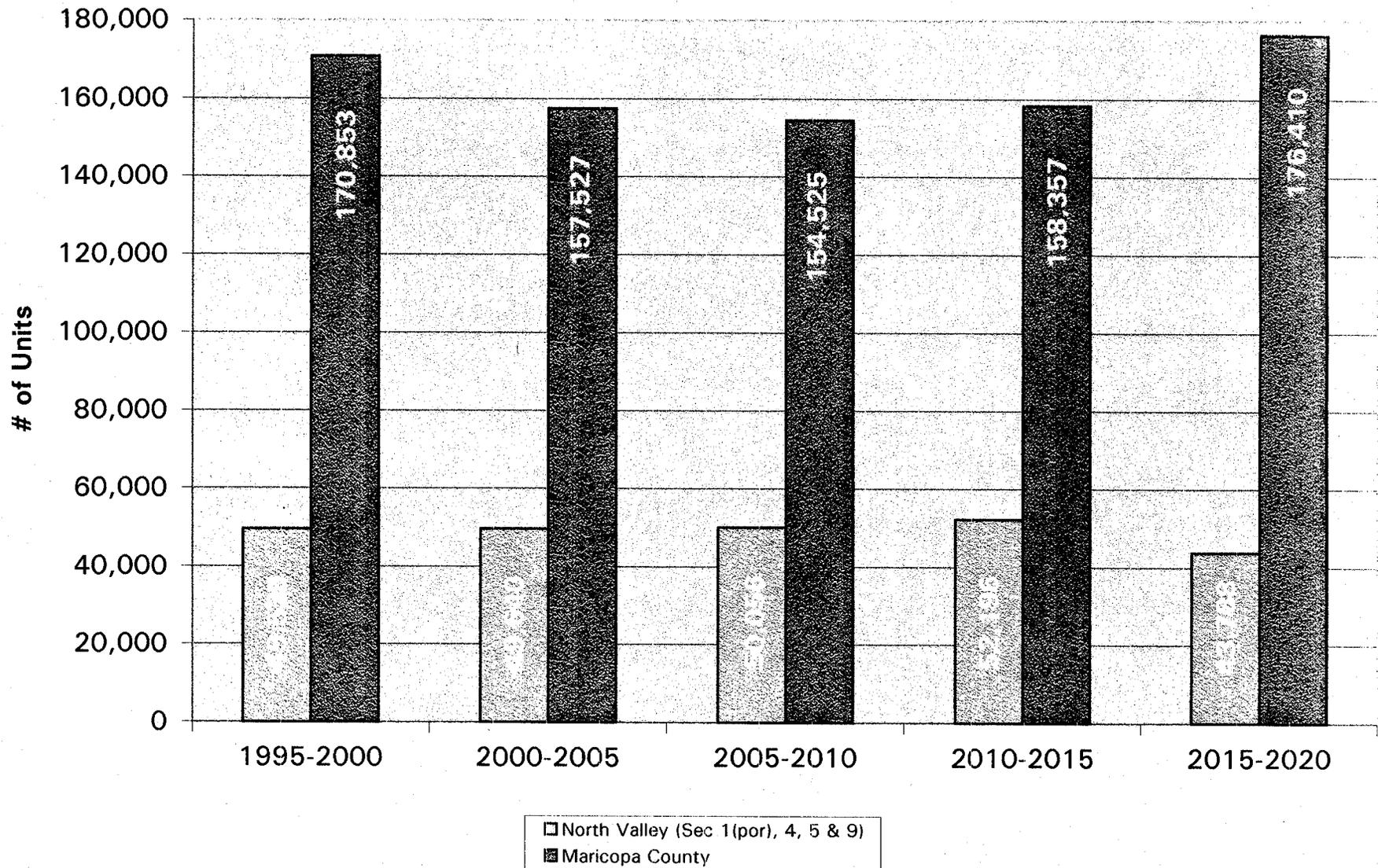
December, 1996

## Projection of Housing Units - North Phoenix vs. Maricopa County

Regional Analysis Zoning Area	Year	Resident Population	Forecasted % Change	Housing Units	Forecasted Change
Section 1 (northeast portion)	1995	1,259	--	440	--
	2000	2,416	13.9%	855	415
	2005	4,479	13.1%	1,647	792
	2010	7,391	10.5%	2,828	1,181
	2015	12,801	11.6%	5,171	2,343
	2020	20,717	10.1%	9,316	4,145
Section 4	1995	16,472	--	6,420	--
	2000	32,301	14.4%	12,920	6,500
	2005	52,456	10.2%	21,571	8,651
	2010	76,867	7.9%	31,863	10,292
	2015	117,628	8.9%	48,935	17,072
	2020	162,942	6.7%	68,636	19,701
Section 5	1995	439,685	--	177,034	--
	2000	500,493	2.6%	202,659	25,625
	2005	540,683	1.6%	221,218	18,559
	2010	586,902	1.7%	240,972	19,754
	2015	618,998	1.1%	253,630	12,658
	2020	648,015	0.9%	265,880	12,250
Section 9	1995	87,695	--	39,221	--
	2000	124,272	7.2%	56,217	16,996
	2005	169,229	6.4%	77,855	21,638
	2010	207,907	4.2%	96,684	18,829
	2015	249,789	3.7%	116,807	20,123
	2020	264,875	1.2%	124,499	7,692
Total for North Valley Sections 1 (portion), 4, 5 & 9	1995	545,111	--	223,115	--
	2000	659,482	3.9%	272,651	49,536
	2005	766,847	3.1%	322,291	49,640
	2010	879,067	2.8%	372,347	50,056
	2015	999,216	2.6%	424,543	52,196
	2020	1,096,549	1.9%	468,331	43,788
Total for Maricopa County	1995	2,528,700	--	1,007,307	--
	2000	2,954,150	3.2%	1,178,160	170,853
	2005	3,329,550	2.4%	1,335,687	157,527
	2010	3,709,575	2.2%	1,490,212	154,525
	2015	4,101,775	2.0%	1,648,569	158,357
	2020	4,516,100	1.9%	1,824,979	176,410

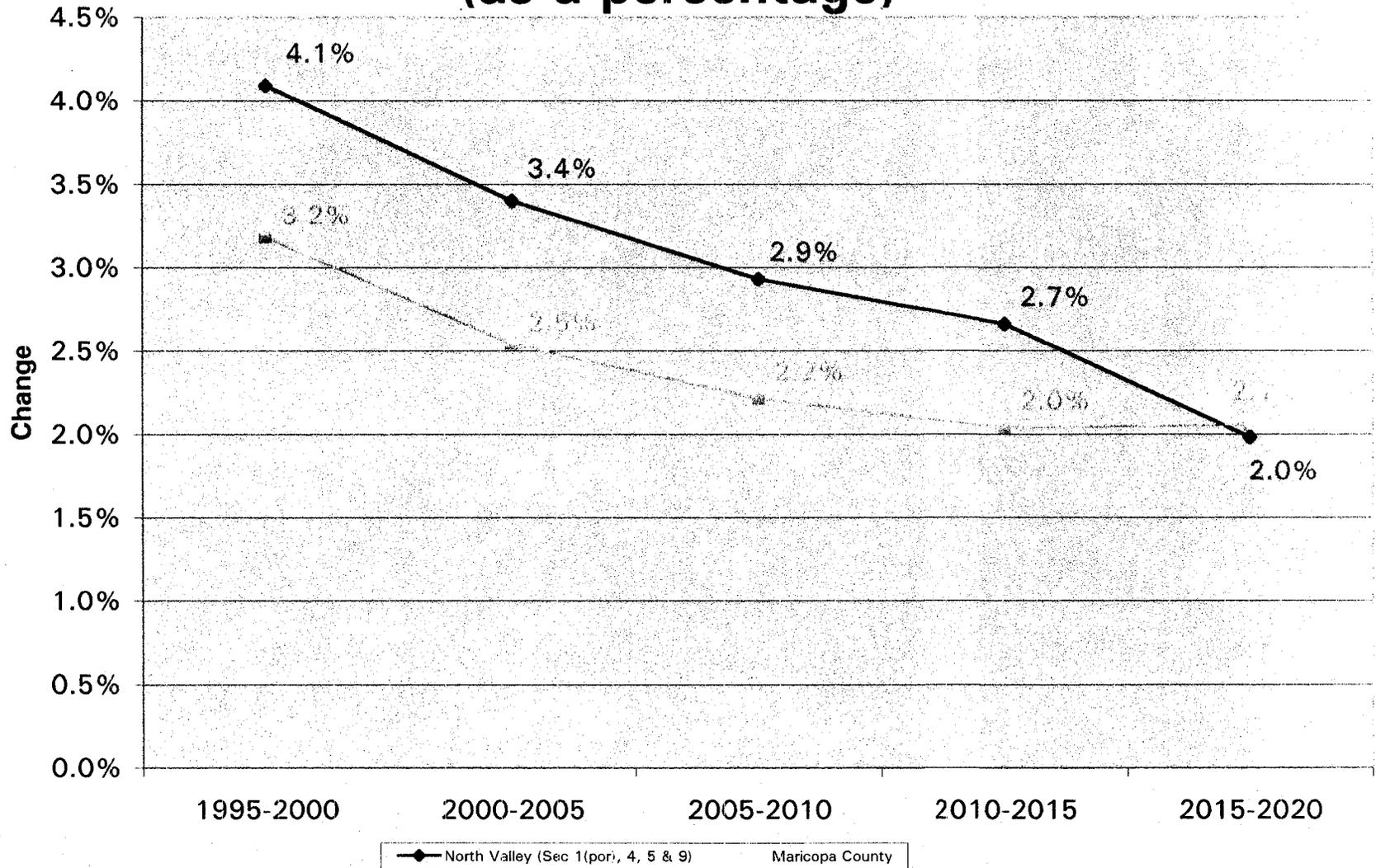
Source: Maricopa Association of Governments, Socioeconomic Projections Interim Report (June 1997)

# Forecast of Annual Resident Unit Increase in Five Year Increments



Source: MAG Socioeconomic Projections Interim Report (June 1997)

# Forecast of Annual Resident Unit Increase in Five Year Increments (as a percentage)



Source: MAG Socioeconomic Projections Interim Report (June 1997)

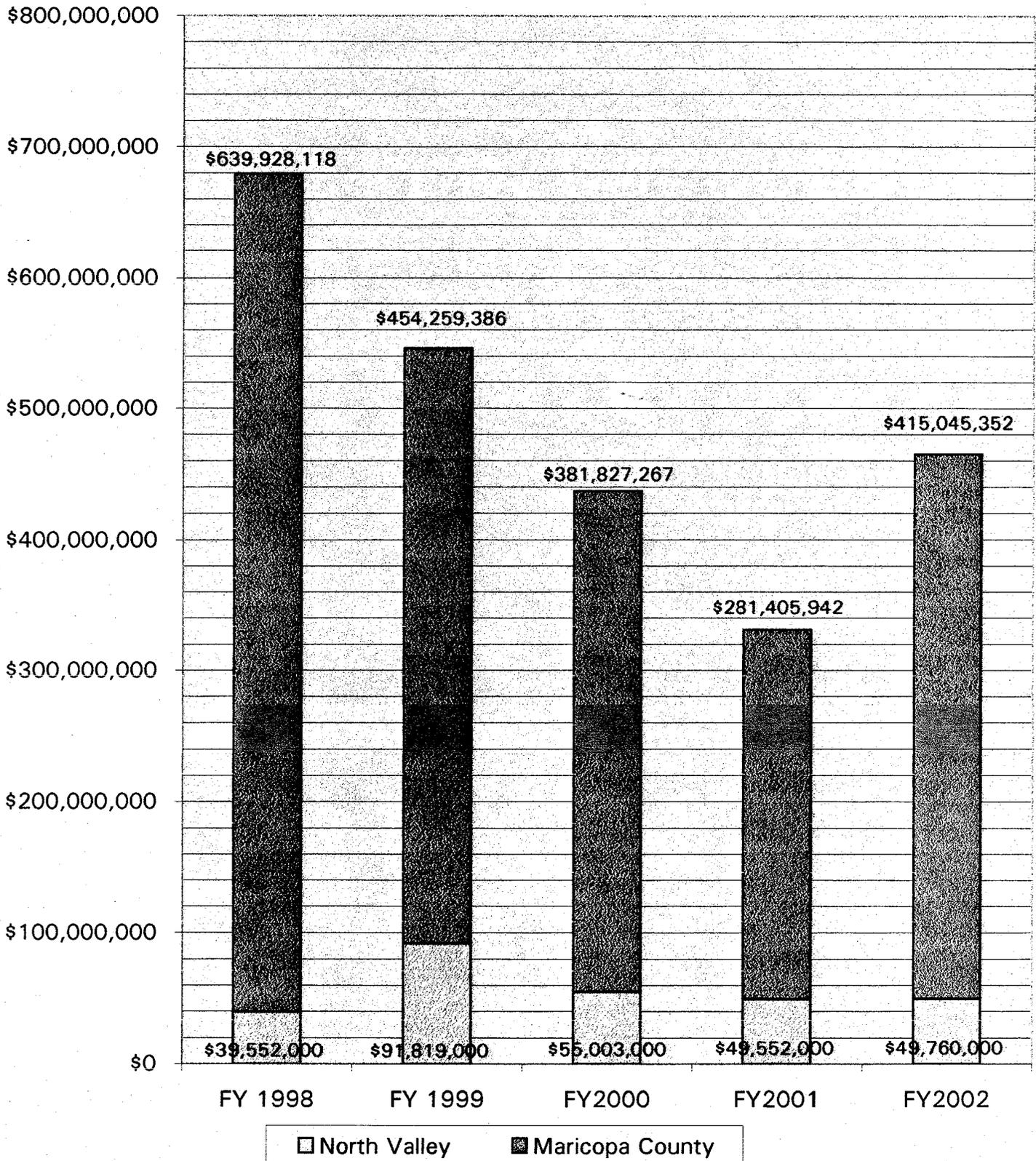
Transportation Improvement Program

The Maricopa County Association of Governments (MAG) has prepared a *MAG Transportation Improvement Program FY 1998-2002 (Draft September 1997)*. On the next page we have presented a graphical analysis of the projects that may impact the subjects' deposit marketability, compared to the total Maricopa County projects. Year-by-year maps of the projects, with the selected projects highlighted, follow the graph.

North Valley projects are a relatively small 6% of budgeted expenditures in the first year, peaking at 20% of all expenditures in 1999 at slightly over \$90 million. The level of activity stays relatively stable for the next three years, at \$50 to \$55 million.

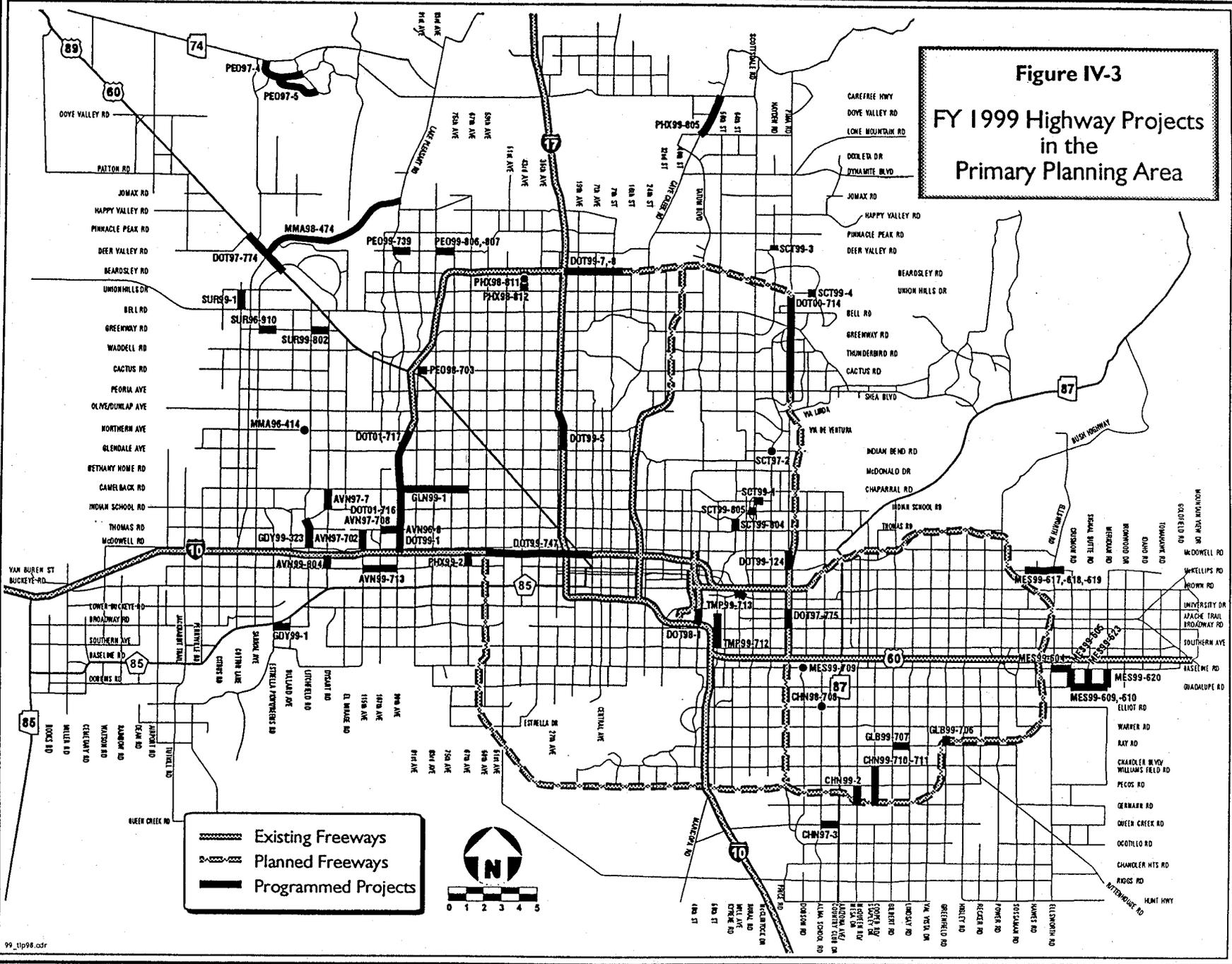
# Transportation Improvement Program 1998-2002 (Highway Projects)

Source: MAG Transportation Improvement Program (Draft 9/97)





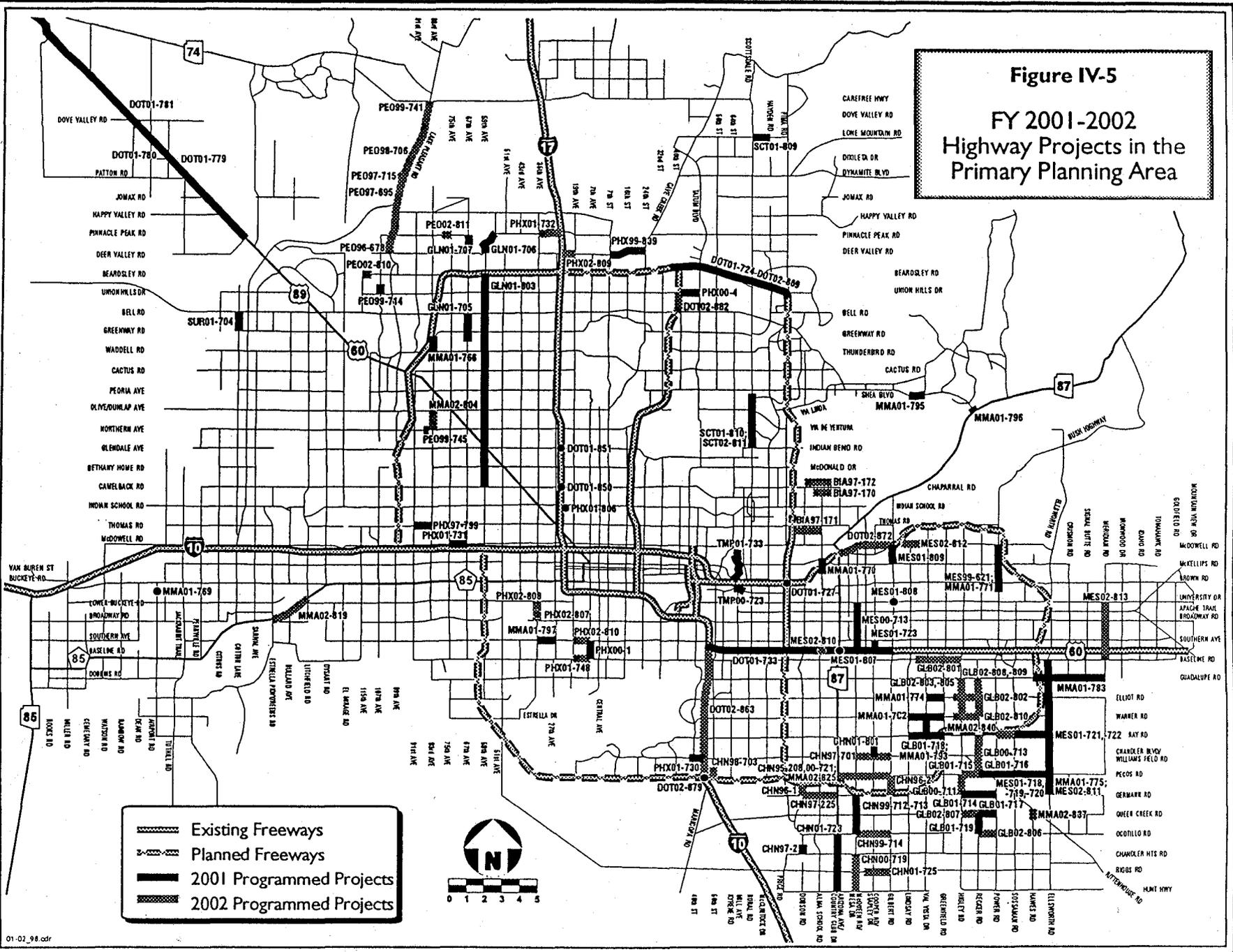
**Figure IV-3**  
**FY 1999 Highway Projects**  
**in the**  
**Primary Planning Area**



99\_tlp98.cdr



**Figure IV-5**  
**FY 2001-2002**  
**Highway Projects in the**  
**Primary Planning Area**



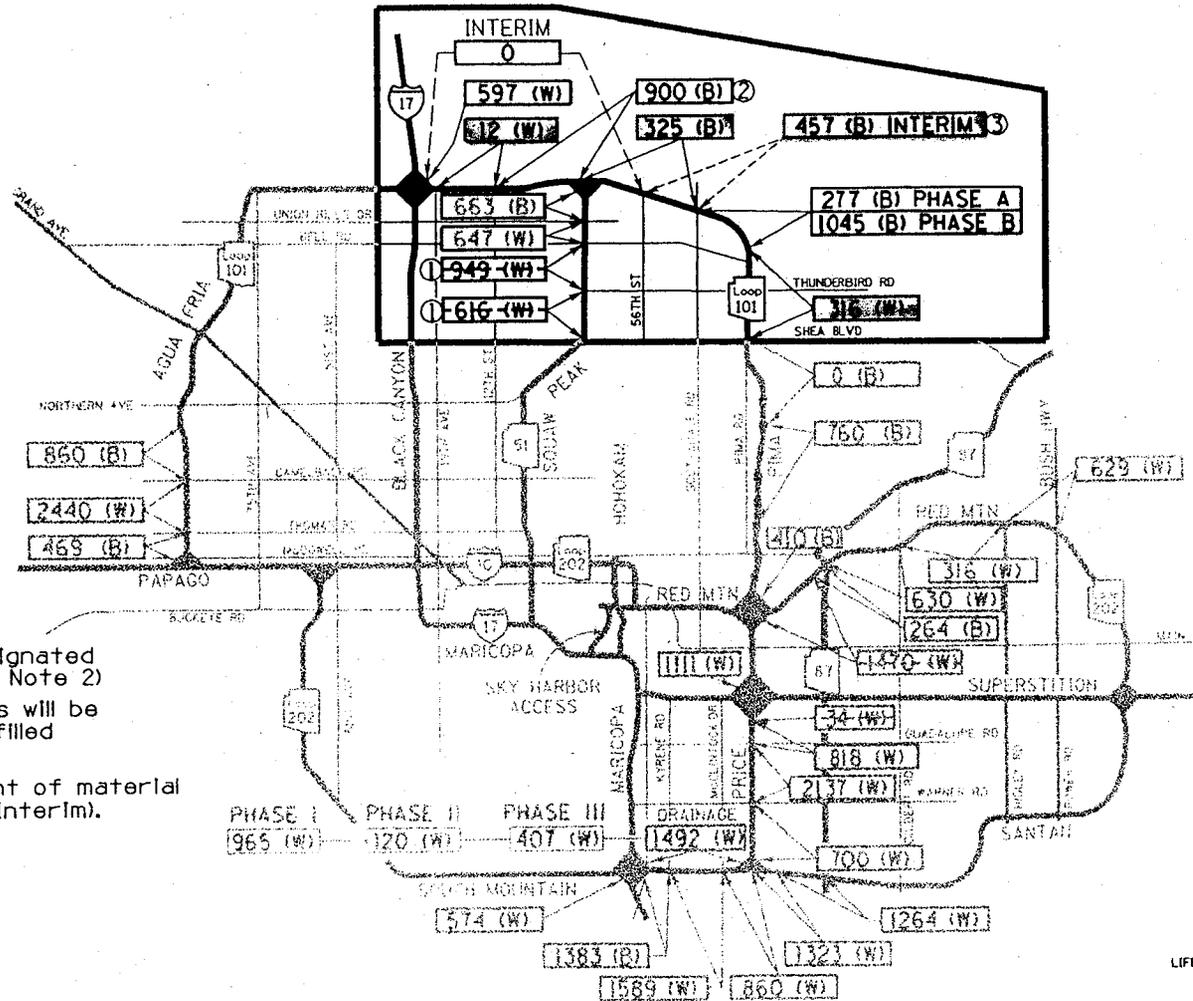
01-02\_98.cdr

Borrow Discussion

DMJM, as a consultant for Arizona Department of Transportation, has provided us with a map analysis of waste and borrow requirements required for freeway projects in the North Valley over the next five years. We have used the MAG Transportation Improvement Program projections to develop the year-by-year analysis. As illustrated, they appear to have balanced the sites to minimize borrow and waste requirements and end up with net borrow over the five years of 514,000 cubic yards with net waste occurring until the year 2000.

# EARTHWORK NORTH MANAGEMENT

	K. CU. YDS.	
<b>1998</b>	<b>Net Waste:</b>	<b>1885</b>
	Waste =	2162
	Borrow =	277
<b>1999</b>	<b>Net Waste:</b>	<b>328</b>
	Waste =	328
	Borrow =	0
<b>2000</b>	<b>Net Borrow:</b>	<b>1945</b>
	Waste =	0
	Borrow =	1945
<b>2001-2002</b>	<b>Net Borrow:</b>	<b>782</b>
	Waste =	0
	Borrow =	782
<b>NET BORROW OVER 5 YEARS</b>		<b>514</b>



**NOTES:**

- ① This material has been designated to the Pima Segments (See Note 2)
- ② These Borrow requirements will be partially or completely fulfilled from Squaw Peak Waste.
- ③ Quantity reflects placement of material from I-17 to 56th Street (InterIm).

**LEGEND**

- 1682 (B)** - BORROW IN K CU.YDS.
- 2400 (W)** - WASTE IN K CU.YDS.
- 34 (W)** - IN CONSTRUCTION



JULY, 1997  
LIFE CYCLE PROGRAM

## ROCK PRODUCTS INDUSTRY

The estimated annual production of construction sand and gravel shipped for consumption nationwide in 1995 was about one billion tons. The 1996 figure was 5.8% higher, also making it the highest production year ever recorded in the United States. This estimate is based on information reported to the *United States Geological Survey, Quarterly Sample*, surveyed by the Crushed Stone and Sand and Gravel Producers. The increases in production of both crushed stone and construction sand and gravel are mostly due to continued high-level activity in private and commercial construction work during the fourth quarter of 1996.

### Arizona Construction Economy

Construction employment in Arizona is above the national average, reaching 6.7% of total employment in 1996, compared to a United States average of 4.5% of employment. The 1996 6.7% level is the highest since the 6.7% level of 1988. Construction as a percent of total employment was at its low point for the most recent cycle in 1991 at 5.2% in Arizona versus 4.2% nationwide.

Metropolitan Phoenix was the second most active single-family housing market in the United States in 1996 with 27,985 permits, placing second behind Atlanta (37,523 permits) and ahead of Chicago, Washington D.C. and New York.

Metropolitan Phoenix ranked first in the nation in terms of multi-family unit permits ahead of all the same communities that ranked in the top five cities in single-family permits.

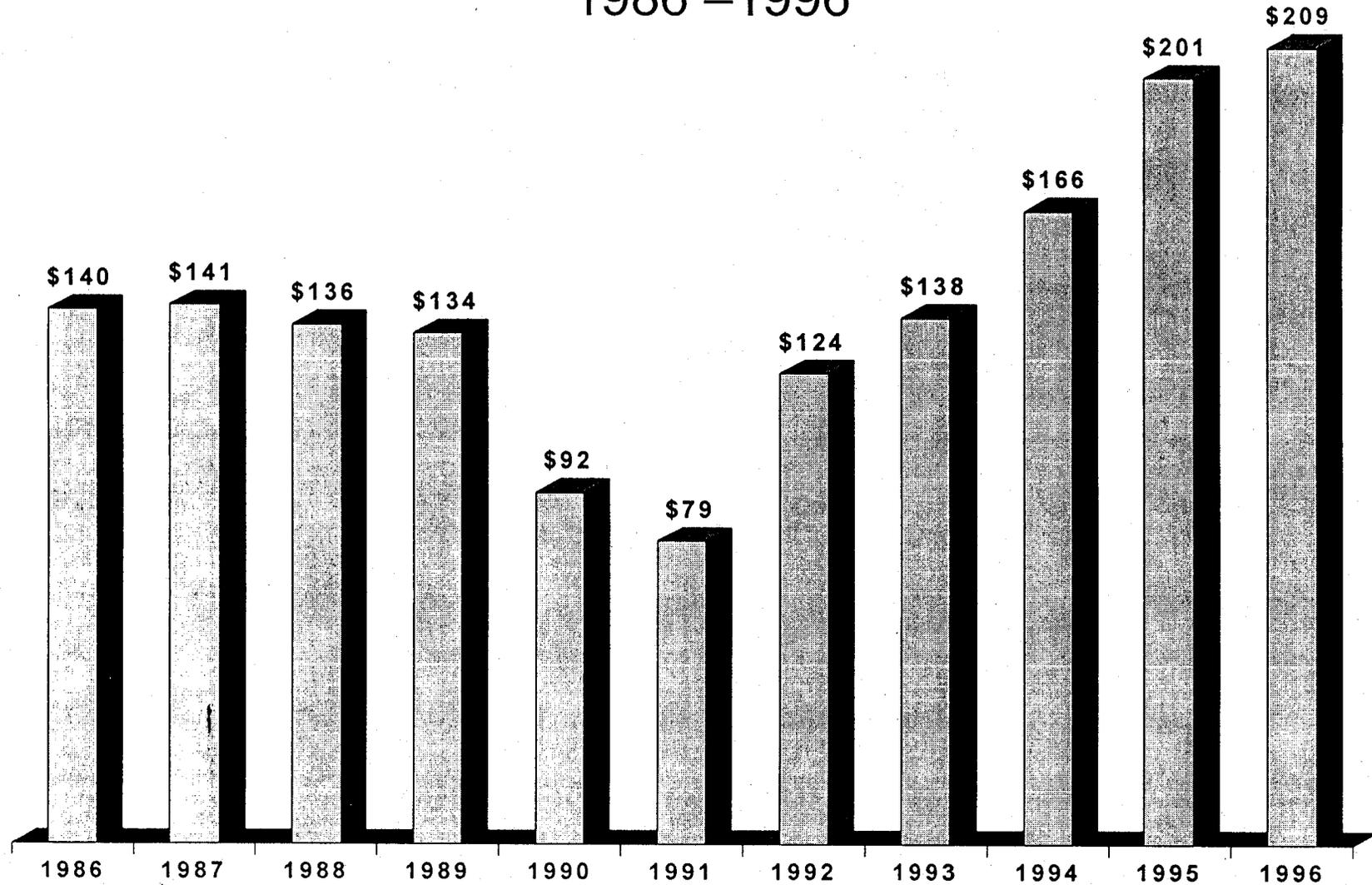
### Value of Rock Production

The rock products industry calculates the 1996 impact on the Arizona economy to have a direct impact of about \$1.1 billion with about 68% attributed to business income. Applying the multiplier effect to the above results in a total impact on the Arizona economy of \$2.2 billion with about 66% going to business income. The same source calculates the value of sand and gravel production in Arizona at an all time high of \$209 million for 1996, up from a low of \$79 million in 1991. A chart illustrating this significance is included on the following page.

# Value of Sand and Gravel Production in Arizona

Millions of Dollars

1986 – 1996



Source: U.S. Bureau of Mines and Arizona Rock Products Association

### Historic Production of Rock Products

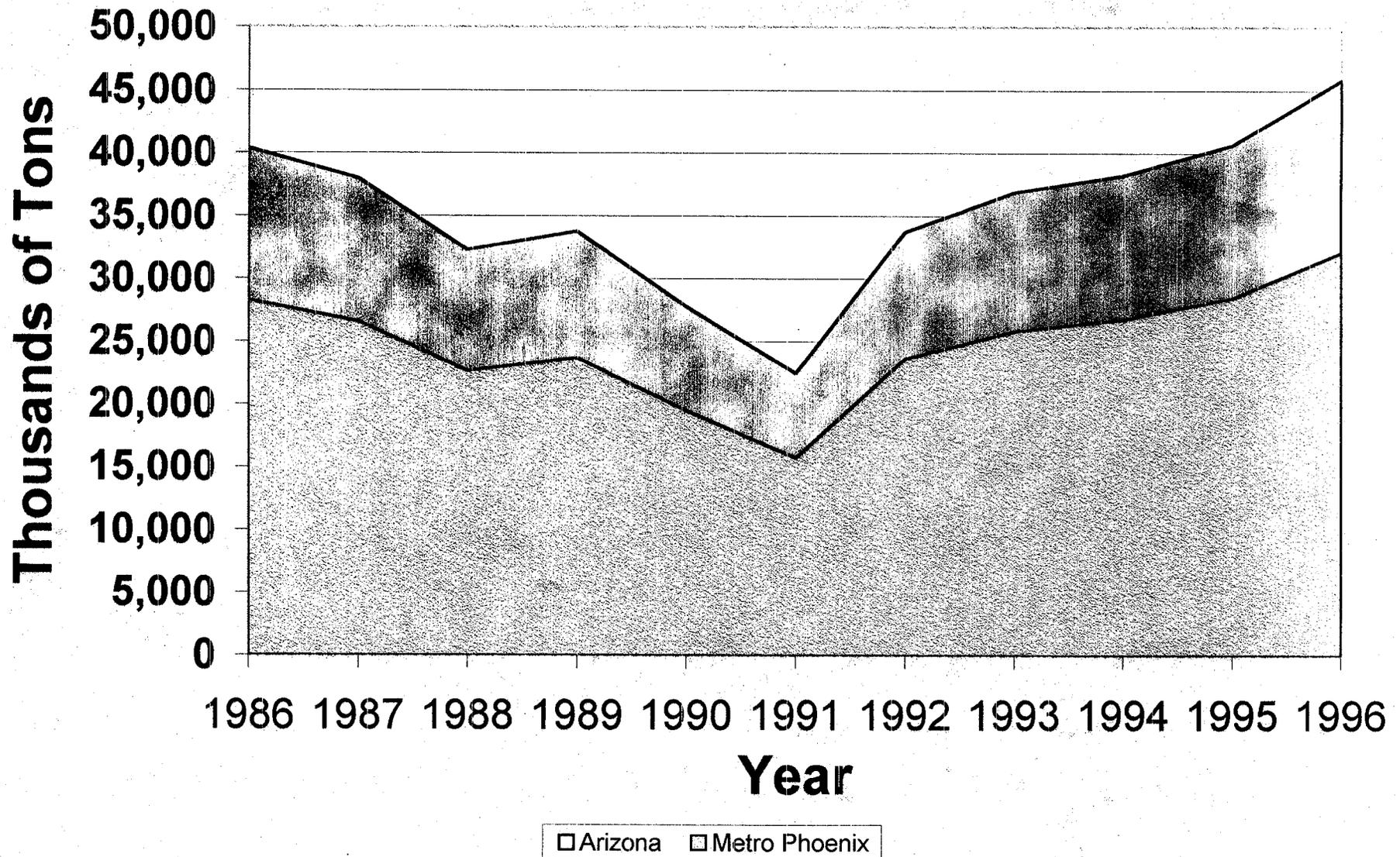
Sand, gravel and concrete products are locally based. Along the river beds and flood plains of Arizona, located close to growing metropolitan areas, are some of the finest sources of sand and gravel in the world. They are the basis for Arizona concrete and asphalt products which are essential for construction not only of residential and office structures, but schools, roadways, hospitals, airports and other private and public facilities.

Sand, gravel, concrete, asphaltic products, concrete products and cement are used by workers in all types of construction, including heavy construction, street and highway construction, commercial and residential construction. For example, a typical 1,600-square-foot house requires 100 tons of sand and gravel. The first 45 miles of Metropolitan Phoenix freeway constructed during the on-going expansion program required 450 tons of cement, 1.8 million cubic yards of concrete and 2.9 million tons of sand and gravel for pavement alone. The combined inner and outer loops of the fully completed freeway systems will consume 92 million tons of sand and gravel and 20 million cubic yards of concrete.

The primary uses for sand and gravel, as broken down by the United States Bureau of Mines and Arizona Rock Products Association, are as follows:

Concrete Aggregate for Construction	20%
Base Road Coverings	17%
Asphaltic Concrete Aggregate	10%
Construction Fill	9%
Concrete Products	2%
Plaster and Gunitite Sands	2%
Other Uses	<u>40%</u>
Total	100%

# Arizona Sand & Gravel Production



## SUPPLY ANALYSIS

Metropolitan Phoenix has an almost unlimited physical supply of generally very good quality sand and gravel deposits. However the regulatory climate and cultural encroachments limits their availability and these limitations are increasing at a rapid rate. Flood zone, environmental disturbances, and zoning are the three obvious regulatory concerns a sand and gravel operator faces. Prospective operators also voiced their concern about meeting Corps of Engineers' requirements since all three sites reportedly qualify as being within the ordinary high water mark.

An illustration of the potential regulatory problems is available from a recent confrontation between the city of Phoenix vs. the state of Arizona and the lessee of the Dixileta gravel pit. The subject Cave Butte Dam property is less than two miles south of the 145 acre Dixileta site which was leased to Wheeler Construction from the State Land Department for 10 years in 1995. In October of 1996, Mayor Skip Rimza attempted to remove Wheeler Construction from the site, threatening criminal charges, saying the company was violating the city of Phoenix' zoning laws. The property is located in the Cave Creek Wash, the core of a proposed 11,000-acre desert preserve in far north Phoenix. There was a provision in Wheeler's lease that says the company will comply with local zoning, according to city of Phoenix officials. The city contended that if Wheeler was allowed to continue its operation "he would put a significant dent" in the preservation plans. "Everything is tied to the washes." After a costly legal battle, reportedly running close to \$1 million divided among the various participants, the lessee and the state prevailed. The ruling was based on a 1973 court ruling in favor of the state and against Phoenix, where it stated that "the City does not have jurisdiction or authority to enforce its zoning regulations on trust lands held by the State." The ruling also stated that Phoenix can not interfere with the State Land Departments duty to "lease the land to its highest and best use."

All of the subject sites are impacted by the general abundance of active Metropolitan Phoenix sand and gravel pits estimated to number about 55, although we were not able to obtain a specific count within the scope of this assignment. The best quality material is in the Salt River bed where depths to 65 feet and potentially more are mined. Presenting the most supply competition for the subject sites, primarily the New River site, are the products available from the Aqua Fria River bed for an approximate 16 mile length extending between Jomax Road and Indian School Road, generally centering along the alignment of what would be 115<sup>th</sup> Avenue. Depths of 65 feet are also mined in Aqua Fria River bed. Considerably more deposits are believed to be available to the north of Jomax Road. These would directly impact the subject New River site which is only two miles east. One operator described the Aqua Fria River rock product as having some of the lowest processing costs available because of the quality of the material. This makes it very difficult for more costly processed product to compete unless it has a location advantage.

On the other hand the competitive supply available in the Cave Creek wash is limited to the Wheeler Construction property discussed earlier, located about two miles north of the Cave Butte Dam site.

Transportation costs at a reported \$.15 to \$.20 per ton mile can be a significant part of the product costs. For this reason, one operator described the maximum operating radius for most major users to be 15 miles.

A map showing the location of the subject, relative to some of the existing sand and gravel operations, is included on the next page.

39400N  
37800N  
36200N  
34600N  
33000N  
31400N  
29800N  
28200N  
26600N  
25000N  
23400N  
21800N  
20200N  
18600N  
17000N  
15400N  
13800N  
12200N  
10600N  
9000N  
7400N  
5800N  
4200N  
2600N  
1000N

New River

Cave Butte

Adobe

EL MIRAGE

YOUNGTOWN

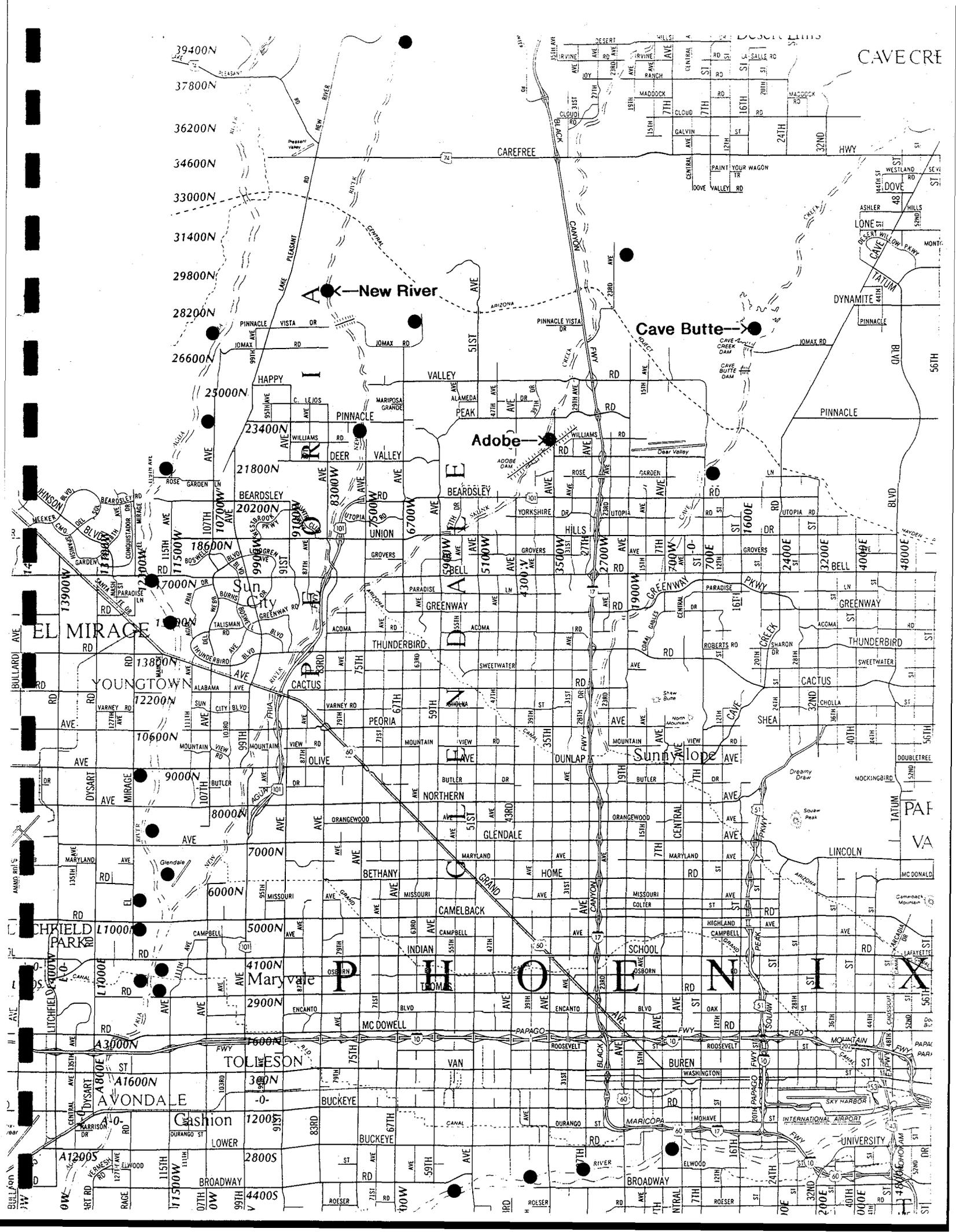
CHFIELD PARK

AVONDALE

Cashion

PHOENIX

UNIVERSITY



## DEMAND ANALYSIS

The demand for aggregate has been described as averaging 9.5 tons per person throughout the United States in 1994. One local operator described the local current demand at 10 to 14 tons per person per year. When applied to the July 1997 estimated Metropolitan population of 2,721,761 a potential demand of 27 to 38 million tons is suggested. This is consistent with the 32.1-million-ton 1996 production suggested for Metropolitan Phoenix by U.S. Bureau of Mines. Applying a 3% growth factor suggests 33 million tons of production for 1997 and about 34 million tons for 1998.

The impact of the current and anticipated growth of the north valley area on the rock products industry is probably best illustrated by two recent state land leases. State land leases are open, competitively bid around a conference table. The state establishes all terms except the royalty rate which is the basis for bidding.

Wheeler Construction Company was the successful bidder for 145 acres located at Dixileta east of 24<sup>th</sup> Street in Phoenix, less than two miles north of the subject Cave Butte Dam site, located in the Cave Creek Wash. The lease is for 10 years beginning on May 30, 1995 with a royalty of \$.60 per ton and a land rent of \$17,400 per year and a 3% administrative fee. The lessee is required to pay a minimum royalty of \$45,000 per year, which would be the equivalent of 75,000 tons of material per year. Gary Slusher reports an average of 35,000 tons per month (420,000 tons per year) are being removed. The lessee reports he is now averaging closer to 40,000 tons per year or 480,000 tons per year. If this higher average is maintained, it would suggest a total annual revenue, including land rent of \$305,400, or about \$2,106 per acre. The state does not differentiate between borrow, sand or gravel. All materials removed from the site are charged at the same royalty.

Both Mr. Slusher and the lessee report the property is being mined to a depth of 15 to 20 feet to date. The lessee does not plan on going deeper because of the poorer quality of the deeper aggregate. This has been a controversial operation the city of Phoenix has tried to close, which is discussed in more detail with the individual dam site data.

Another recent lease that illustrates one of the higher royalty rates we are aware of involved FNF Construction as the successful bidder with the state as lessor. The property to be mined is 320 acres in the New River area, that are legally described as the northwest quarter of Section 16 and the northeast quarter of Section 17, Township 6 North, Range 2 East of the Gila Salt River Baseline and Meridian located just west of the new outlet mall in New River. The next highest bidder was Wheeler Construction. Wheeler Construction has subsequently filed an application with the state to lease an adjacent 160 acres, being the southeast corner of Section 17, Township 6 North, Range 2 East of the Gila and Salt River Baseline and Meridian.

The 10-year FNF lease began June 25, 1996 at a new state high of \$1.65 per ton. In addition there will be a land rent of \$12,800 per year and a 3% administrative charge. The minimum royalty is \$57,750 per year. This is equivalent to 36,094 tons per year. This lease activity is directly related to the expected demand created by the infrastructure and home construction scheduled to begin in late 1997 or early 1998 in the Villages at Desert Hills, being developed by the Del Webb Company.

The demand for sand and gravel deposits from any one location is directly related to pricing. The operators interviewed all volunteered that economic production at the subject sites would only occur if priced reasonably. The reasonable ranges recited by several were \$.50 to \$.75 per ton and \$.60 to \$.80 per ton. Estimating a market royalty rate for the subject properties is beyond the scope of this assignment, however the conclusions arrived at herein are necessarily dependent upon a market competitive royalty rate being in place.

In summary virtually all the parties interviewed agreed that there would be enthusiastic demand for the subject sites if they were made available for sand and gravel production assuming adequate protection from liability for dam integrity were provided. Lease terms of as long as 20 years would be preferred by the major players. Because of the recent vitality of the Metropolitan Phoenix economy and its perceived strength for the foreseeable future there is pressure within the industry to tie up and develop new reserves. Nearly all of the major players and many of the smaller companies are looking for sand and gravel reserves near new expected development areas.

## SUBJECT PROPERTIES

### New River Dam Site

This site is assumed to be about 640 acres upstream of the New River Dam, available for the legal excavation of sand, gravel and borrow products and for installation of concrete and asphalt batch plants outside of any normal flood danger. Good access is assumed to be available from Lake Pleasant Road to allow for the transportation of material and the deposits are assumed to be of marketable quality and capable of supporting a rock product mining operation. While these assumptions are reasonable potentials and consistent with the MCDOT's instructions to the analysts, no engineering data are available to the analysts and no warranty is expressed or implied herein that the assumptions can be achieved. The availability of processing water and electricity is also important but any installation costs would normally be the expense of the operator.

This is the farthest north and farthest west of the three subject sites being more removed from concentrated demand and the most vulnerable to competition. Deposits in all three of the subject north valley stream beds are described by one geologist familiar with the area as being basalts, siliceous volcanics and meta-sediments as opposed to the Gila and Salt River sediments found in the Salt River.

The potential deposits at this New River location are believed by most of the interviewees to be potentially the best quality and volumes available of any of the three sites analyzed herein. Considered to be the most dominant drainage feature of the three, it potentially has coarser sediments and better sands. The more the site that the county designates for excavation is in the main stream, the higher the quality to be expected. However all three of the subject sites are more suspect in relation to otherwise similar sites in the same stream beds because of their location immediately upstream from a dam. Years of sediment impoundment are suspected of leaving several feet to potentially 10s of feet of sediment. The expense of stripping this overburden can limit the potential for operating a successful rock product facility.

Although the subject New River site may contain the best deposits, it is generally more distant from most end users than the other two subject sites. It is also farther from most west side users than a large number of pits located in the Aqua Fria River bed beginning about two miles west and one mile south of the subject New River location and continuing south for about 16 miles. Therefore the demand side of the equation suggests this site, for the near term future, to be the least desirable of the three subject sites.

P/OS

P/OS

P/OS

LD

CC

CC

RE

LD

CENTRAL

ARIZONA

PROJECT

CANAL

NEW RIVER

DEADMAN WASH

RE

RE

P/OS

P/OS

BOUNDARY

LD



NEW RIVER RETENTION BASIN

LD

P/OS

RE

LAKE PLEASANT PARKWAY

CC

LD

RE

RD

CC

LD

P/OS

MD

BEARHOLEY CANAL

RD

MD

LD

RD

LD

CC

RD

HEFFNER DAM

LD

P/OS

LD

P/OS

LD

CC

RD

LD

LD

LD

LD

LD

LA. GOVERNMENT

P/OS

P/OS

North

New River

← New River

NEW RIVER DAM



### Adobe Dam Site

This site is also assumed to be about 640 acres, but upstream of the Adobe Dam, available for the legal excavation of sand, gravel and borrow products and for installation of concrete and asphalt batch plants outside of any normal flood danger. The areas available for excavation may not be contiguous as suggested by the free drawn areas suggested by the county on the exhibit on the next page. Good access is assumed to be available from Pinnacle Peak Road and 35<sup>th</sup> Avenue to allow for the transportation of material, and the deposits are assumed to be of marketable quality and capable of supporting a rock product mining operation. While these assumptions are reasonable potentials and consistent with the MCDOT's instructions to the analysts, no engineering data are available to the analysts and no warranty is expressed or implied herein that the assumptions can be achieved. The availability of processing water and electricity is also important but any installation costs would normally be the expense of the operator.

This site is impacted more by urban development than any of the three sites considered herein. It enjoys immediate proximity to the Black Canyon Freeway and reasonably good proximity to demand but also subject to the competitive supply available from the bed of the Agua Fria River. Deposits in all three of the subject north valley stream beds are described by one geologist familiar with the area as being basalts, siliceous volcanics and meta-sediments as opposed to the Gila and Salt River sediments found in the Salt River.

The potential deposits at this Skunk Creek location are believed by most of the interviewees to be potentially the poorest quality available of the three sites analyzed herein. The more the site that the county designates for excavation is in the main stream of Skunk Creek, the higher the quality to be expected. However all three of the subject sites are more suspect in relation to otherwise similar sites in the same stream beds because of their location immediately upstream from a dam. Years of sediment impoundment are suspected of leaving several feet to potentially 10s of feet of sediment. The expense of stripping this overburden can limit the potential for operating a successful rock product facility.

Although the subject Adobe site may contain the poorest quality deposits of the three, it is reasonably convenient to demand and is likely to be capable of producing more revenue than the New River location in the near term but less than the Cave Butte site.

- R2E -

9

10

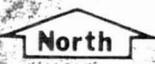
16

15

21

22

- R2E -



Pinnacle Peak Rd.

WATERWORLD USA

ADOBE DAM G.C.

500 CLUB G.C.

VICTORY LANE SPORTS COMPLEX

Adobe →



ADOBE DAM

ADOBE DAM RECREATION AREA

Deer Valley Rd.

AGUA FRIA Fwy. / LOOP 101 (EST. COMP. 1996)

51st Ave.

43rd Ave.



### Cave Butte Dam Site

This site is again assumed to be about 640 acres. There are four non-contiguous parcels tentatively identified by the county to be available for excavation and plant site development in the area of Cave Butte Dam. All are not upstream of the Cave Butte Dam, but the primary area shown appears to be in the stream bed. The parcels are assumed to be available for the legal excavation of sand, gravel and borrow products and for installation of concrete and asphalt batch plants outside of any normal flood danger. Good access is assumed to be available from Cave Creek Road to allow for the transportation of material, and the deposits are assumed to be of marketable quality and capable of supporting a rock product mining operation. While these assumptions are reasonable potentials and consistent with the MCDOT's instructions to the analysts, no engineering data are available to the analysts and no warranty is expressed or implied herein that the assumptions can be achieved. The availability of processing water and electricity is also important but any installation costs would normally be the expense of the operator.

This site is impacted more by proximity to demand with relatively limited competition in comparison to the other two sites under consideration herein. Deposits in all three of the subject north valley stream beds are described by one geologist familiar with the area as being basalts, siliceous volcanics and meta-sediments as opposed to the Gila and Salt River sediments found in the Salt River.

The potential deposits at this Cave Butte Dam location are believed by most of the interviewees to potentially be of reasonably good quality but inferior to those of New River. Hugh Gilbert, Vice President of Wheeler Construction, the lessee of the 145 acres Dixelela state lease property immediately north of subject, reports they are mining very useable material to depths of 15 to 20 feet with virtually no overburden. Below this depth the material reportedly has too much plasticity. Some of the material is also reported to be too rocky. Here again the main stream land is expected to yield the best quality materials.

All three of the subject dam sites are more suspect in relation to otherwise similar sites in the same stream beds because of their location immediately upstream from a dam. Years of sediment impoundment are suspected of leaving several feet to potentially 10's of feet of sediment. The expense of stripping this overburden can limit the potential for operating a successful rock product facility.

This site enjoys the best proximity to demand of the three subject dam sites. The operators interviewed were all in agreement that this site would be the best producer because of its proximity to demand with less competing sources. Hugh Gilbert of Wheeler Construction states that they are very anxious to work with the county to extend their current operation to the county lands adjacent south and eventually combine the state and county lands for development into a golf course.



North

Cave Creek

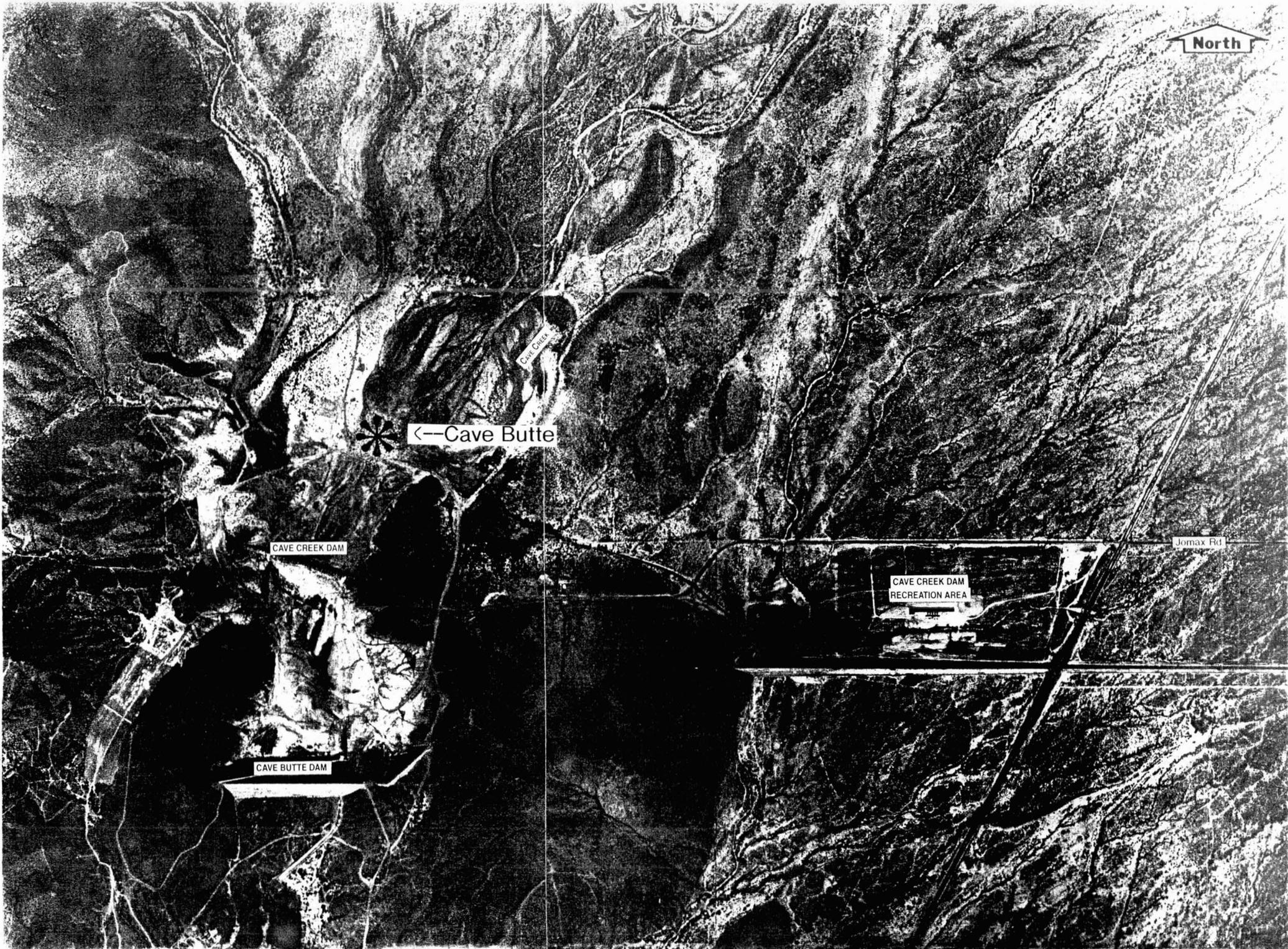
← Cave Butte

CAVE CREEK DAM

Jomax Rd

CAVE CREEK DAM  
RECREATION AREA

CAVE BUTTE DAM



## CONCLUSIONS

In summary virtually all the parties interviewed agreed that there would be enthusiastic demand for the subject sites if they were made available for sand and gravel production assuming adequate protection from liability for dam integrity were provided. Lease terms of as long as 20 years would be preferred by the major players. Because of the recent vitality of the Metropolitan Phoenix economy and its perceived strength for the foreseeable future there is pressure within the industry to tie up and develop new reserves. Nearly all of the major players and many of the smaller companies are looking for sand and gravel reserves near new expected development areas.

The demand for borrow tends to be very project specific such as the south runway at the Sky Harbor Boulevard. None of the operators expressed any general or current specific market need for borrow. The limited demand is typically filled as a by-product to their sand and gravel production. Both the nearby freeway projects and the Del Webb Villages at Desert Hills projects were investigated and found to be near balanced. State land leases currently do not differentiate between the royalty costs for sand and gravel vs. borrow. However in recognition of its lower retail price, they are currently contemplating devising a way to price it separately.

The rock product's industry members consider both their specific production and supply-and-demand quantities as privileged confidential information. Therefore some estimates and assumptions are needed to determine at least a fair share production level for subject. There are believed to be about 55 active mining locations in Maricopa County serving the sand and gravel industry. We are estimating that about 12 of these locations are deep pit sites operated by the half dozen largest producers and that they average about 1.5 million tons of production per year. Subtracting this 18 million tons of production from 34 million tons of projected annual production for 1998 leaves 16 million tons to be divided among approximately 43 sites. This suggests a fair share production of about 372,000 tons per site for the non-deep-pit locations.

The distribution of production between sites is subject to a number of variables. Product quality, production cost, royalty cost, transportation cost and long-term planning that might dictate the removal of materials from a leased site versus a fee simple-owned site are some of the factors that are considered. The motivation for preserving reserve material on a fee simple owned site may be its location in the heart of an urban area where supplies cannot be replenished.

Proximity to demand is the primary criteria as to where a sand and gravel product will be produced when all other factors are similar. Less expensive processing costs will tend to prevail when the distance to demand is similar. When these factors are weighed, the subject Cave Butte Dam site and possibly the Adobe Dam site has the potential to produce more than their fair share and the New River Dam location, something less than its fair share.

Probably the most reliable measure of demand driven production potential for the three subject sites are those expressed by several operators when specifically requested to comment on same. The range of potential production suggested for the average non-deep-pit Metropolitan Phoenix site was from 300,000 to 700,000 tons per site. The range of near term potential production for each of the subject sites was projected from 100,000 to 500,000 tons per year, with New River Dam site at the low end and the Cave Butte Dam site at the high end. The approximate 480,000 tons being produced at the Dixileta state lease site immediately north tends to confirm the projection for the Cave Butte Dam location.

After considering all of the facts available to us, subject to the special predications and underlying assumptions contained herein we have concluded that a reasonable rate of production to be expected from the subject sites, as of October 17, 1997, are as follows:

New River Dam site	150,000 tons per year increasing as much as 10% per year
Adobe Dam site	350,000 tons per year
Cave Butte Dam site	450,000 tons per year

## CERTIFICATION

I hereby certify that, to the best of my knowledge and belief, the statements of fact contained in this report are true and correct. I further certify that the reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions and conclusions. I further certify that I have no present or prospective interest in the analyzed properties, and I have no personal interest or bias with respect to the parties involved. My compensation is not contingent on an action or event resulting from the analyses, opinions, or conclusions in, or the use of, this report. The assignment was not based on a requested minimum opinion, or a specific opinion.

The analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice of the Appraisal Foundation and the Code of Professional Ethics and Standards of Professional Practice of the Appraisal Institute as they apply to consulting assignments. As provided for within the Standards, authorized members of committees or staff within the Appraisal Institute may have a legal right to review this report. As of the date of this analysis, Wendell L. Montandon, MAI, is currently certified under the Appraisal Institute's voluntary continuing education program. No one provided significant professional assistance to the persons signing this report.

  
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Wendell L. Montandon, MAI  
Certified General Real Estate Appraiser  
Certificate Number 30159, State of Arizona

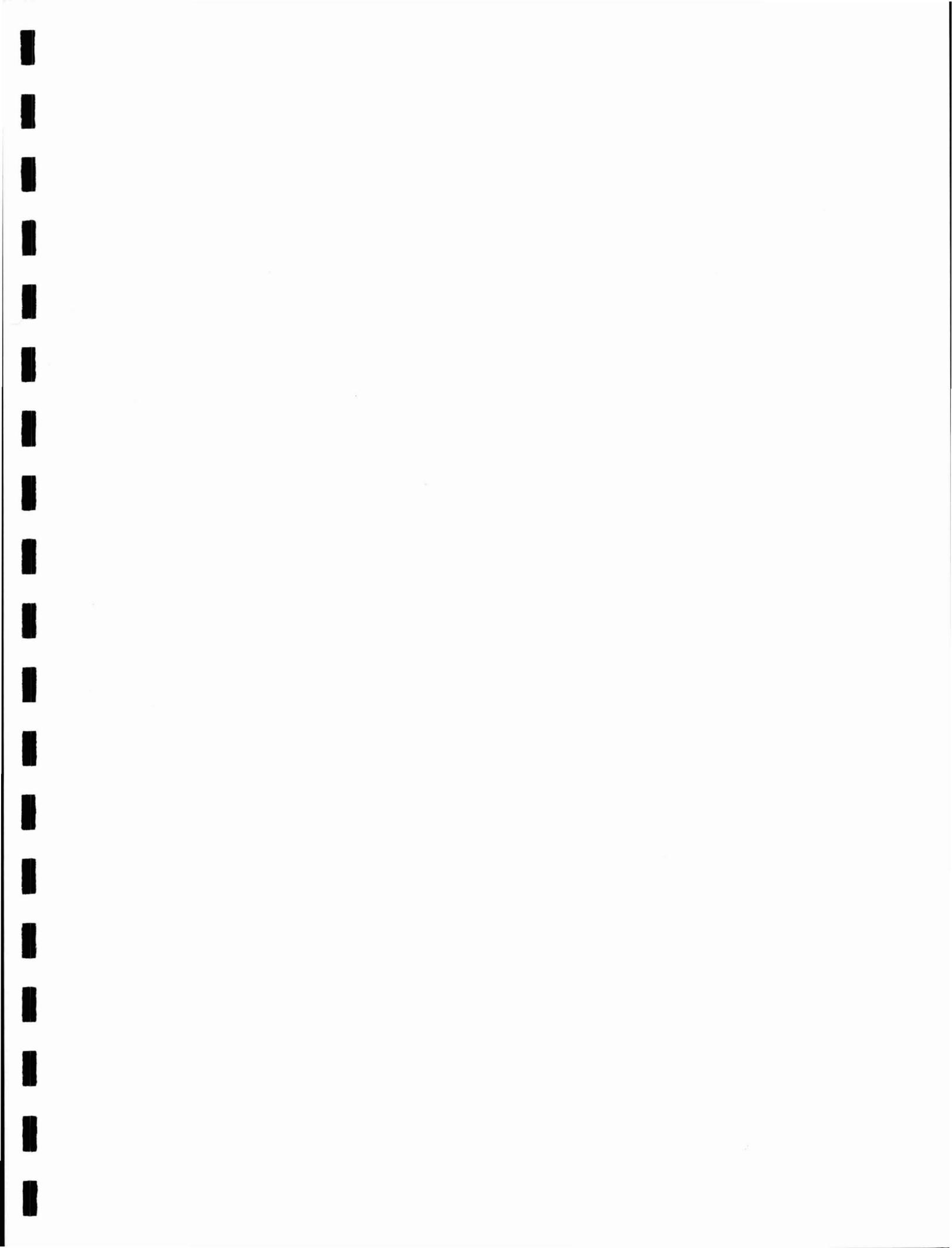
## SPECIAL PREDICATIONS

This is a limited scope assignment to the extent that we have been asked to assume the following, which are made special predications for our conclusions:

- 1) The site has sufficient access to allow for the removal of material
- 2) The material is of marketable quality and will support a mining operation
- 3) Operations will be legal
- 4) The operator will have approximately one square mile in which to work

## UNDERLYING ASSUMPTIONS AND LIMITING CONDITIONS

1. That title to the property is good and merchantable.
2. That no liability is assumed on account of inaccuracy or errors in any information furnished by others whom this analyst contacted at the site or elsewhere and which has been used in making this analysis.
3. That no responsibility is assumed for legal matters affecting the property, such as title defects, liens, overlapping boundaries, etc.
4. That no survey has been made of the property for purposes of this report.
5. That no right is given to publish this report or any part thereof without the written consent of the writer.
6. That the estimates contained herein apply as of the date of this analysis only.
7. That we do not authorize the out-of-context quoting from or partial reprinting of this report. Further, neither all nor any part of this report shall be disseminated to the general public by the use of media for public communication without the prior written consent of the appraiser signing this report, particularly as to conclusions, the identity of the analyst or firm with which he is connected, or any reference to the Appraisal Institute, or the MAI designation.



## QUALIFICATIONS

### WENDELL L. MONTANDON, MAI

*Real Estate Appraiser, Market Research Analyst, and Consultant*

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#### **Professional Experience**

Thirty-four years as full-time real estate appraiser and consultant. Associated with Frank Kelly, MAI, from September of 1962 through July of 1972. Acquired appraisal firm of Kelly & Kelly from Estate of Frank Kelly in July of 1972. In December 1973, the Kelly & Kelly firm was merged with that of Walter Winius, Jr., MAI, to form the appraisal and planning firm of Winius Montandon, Inc. In July of 1997, the advisory and appraisal firm of Montandon Farley RE-AD Group Inc. was formed with analysts having a combined 70+ years experience of working together at Winius Montandon, Inc.

#### **Education**

BS degree in construction from Arizona State University in 1963; Graduate course in Current Real Estate Problems, 3/65

Various required and elective real estate courses by the American Institute of Real Estate Appraisers prior to obtaining the MAI designation in 1974. Subsequently attended numerous seminars sponsored by real estate affiliates, including week-long sessions in Investment Analysis and Statistical Analysis. Currently certified under the Appraisal Institute's continuing education program.

#### **Professional Affiliations**

Member, Appraisal Institute (a merger of the American Institute of Real Estate Appraisers and the Society of Real Estate Appraisers)

Served the American Institute of Real Estate Appraisers or the Appraisal Institute as follows:

National Appraisal Review Committee, 1975-77  
National Elective Examinations Committee, 1978-85;  
Chairman, 1984-85; Vice Chairman, 1983  
National Board of Examiners - Examinations, 1984-85  
National Division of Professional Certification and  
Recognition Committee, 1983

**Professional Affiliations**  
(Continued...)

Regional Panel of Professional Standards Committee,  
1990-1992  
President of Arizona Chapter 41, AIREA, 1980  
Chapter Membership Committee, 1984  
National Research and Information Committee, 1992-93  
National General Examinations Committee. 1992-94  
Assistant Regional Member, Review and Counseling  
Committee, 1992-93  
Member - Commercial Mortgage Bankers Association

**Certifications**

Certified General Real Estate Appraiser  
Certificate Number 30159, State of Arizona

Certified General Real Estate Appraiser  
License Number 01012, State of Nevada

Property Tax Agent, State of Arizona  
Registration Number 910279

**Community Service**

Past President, Phoenix Sundown Rotary  
Past Member, Phoenix Rehabilitation Appeals Board  
Current Member at Rotary Club "100" Phoenix

**Geographic Area  
of Expertise**

Specialize in Arizona assignments, but have evaluated  
properties in more than 20 states, including California,  
Nevada, Texas, and Utah.

**Qualification As  
Expert Witness**

Maricopa County Superior Court  
Pima County Superior Court  
Yavapai County Superior Court  
Yuma County Superior Court  
Federal Bankruptcy Court  
US District Court  
US Tax Court

## Representative Clients

Banc One  
Bank of America  
Bank of Boston  
Bankers Trust Company, New York, NY  
Chase Bank of Arizona  
Chemical Bank, New York, NY  
Citibank (Arizona)  
Comerica Bank-California  
Crocker National Bank, California  
First Interstate Bank of Arizona  
First National Bank of Arizona  
First National Bank of Chicago  
First Nationwide Bank  
Firststar Metropolitan Bank  
Imperial Thrift & Loan Association  
Interfirst Bank of Dallas and Houston

American Savings & Loan Association  
Bank One, Arizona; Trust Real Estate Department  
Beverly Hills Business Bank, FSA  
California Federal Savings & Loan  
Carteret Savings & Loan, Morristown, NJ  
Citizens Federal Bank  
Columbia Savings & Loan Association

Atlantic Asset Management  
Baptist Foundation of Arizona  
Bonnet Resources Corporation (A Banc One Company)  
Crossland Mortgage

Financial Resource Management Trust Company  
Harris Trust Bank of Arizona  
Investors Mortgage Loan Service  
J.E. Roberts

American National Insurance Company  
Equitable Life Assurance Society  
Illinois Mutual  
Insurance Company of North America  
Metropolitan Life Insurance Company

Beer, Toone & Ryan, P.C.  
Bonnett, Fairbourn & Friedman  
Bryan, Cave, McPheeters & McRoberts  
Brown & Bain, Attorneys  
Larry Cohen, Attorney  
Fennemore Craig  
Howard C. Meyers, P.C.  
Jaburg & Wilk, P.C.  
Jennings, Strouss & Salmon, Attorneys  
Lewis & Roca, Attorneys  
Loeb & Loeb, Attorneys

Mariscal, Weeks, McIntyre & Friedlander  
M & I Thunderbird Bank  
McCabe, O'Donnell, Wright & Merritt  
National Bank of Arizona  
NCNB Texas  
The North American Bank  
Norwest Bank Nebraska

Security Pacific Bank - Arizona  
Pittsburgh National Bank  
Republic National Bank of Arizona  
Rio Salado Bank  
Texas Commerce Bank, Houston  
U.S. Bancorp, Portland  
Wells Fargo Bank, N.A.

First Financial Bank  
Great American First Savings Bank  
Great Western Bank, Northridge, CA  
Home Federal Savings & Loan Association  
Mercury Savings and Loan Association  
Rocky Mountain Bank, FSB  
Western Federal Savings & Loan Assn.  
J&S-AM&G Joint Venture  
Keig & Mure Mortgage, Inc.  
McMorgan & Company  
State Bond & Mortgage Insurance Company  
Valley National Bank Trust Department  
Wells Fargo Realty Advisors

**Representative Clients - (Continued...)**

Minnesota Mutual Life Insurance Company  
Principle Mutual Life Insurance Group  
Standard Insurance Company, Portland, OR  
State Mutual Life Assurance Company of America  
United of Omaha Life Insurance Company

Mitten, Goodwin & Raup  
Mohr, Hackett, Pederson, Blakley, Randolph  
& Haga, P.C.  
Molloy, Jones & Donahue, P.C.  
Murphy & Posner  
O'Connor, Cavanagh, Anderson, Westover,  
Killingsworth & Beshears  
Ryley, Carlock & Applewhite, Attorneys  
Shearman & Sterling  
Snell & Wilmer, Attorneys  
Streich Lang, PA  
Tarkington, O'Connor & O'Neill  
Warner, Angle, Roper & Hallam, P.C.

Arizona Public Service Company  
Bellamah Community Developers  
Cabot, Cabot & Forbes Development Company  
Carl's Jr. Restaurants  
Chevron  
The Colby Company  
The Chris-Town Company  
Combined Health Resources  
Jim Custer Realty, Inc.  
Empire Machinery  
Exeter Development, Inc.  
The Feldman-Hickox Company  
Firestone Tire & Rubber Company  
General Electric Company  
Goodyear Tire & Rubber Company  
Grossman Company Properties  
Heron Financial Corporation  
Honeywell, Inc.  
Humble Oil & Refining Company  
IBM Corporation  
Jaren Corporation  
Johannessen Girand, Consulting Engineers, Inc.

City of Avondale  
City of Glendale  
City of Peoria  
City of Phoenix  
City of Mesa  
City of Scottsdale

City of Tempe  
City of Tolleson  
Maricopa County  
Maricopa County Flood Control District  
Maricopa County Highway Department  
Arizona State University  
Cartwright School District  
Osborn School District  
Peoria School District  
Phoenix Elementary School District  
Wickenburg School District

Kentucky Fried Chicken  
MCO Properties/Horizon Corporation  
Mariani-Buss Associates  
Marriott Corporation  
McDonald's Corporation  
Mobil Oil Corporation  
P M Realty Advisors  
Irwin Pasternack, Architect  
Perini Corporation  
Retirement Corporation of America  
Safeco Title Insurance Company  
Samaritan Health Services  
Schuck & Sons Construction Company  
Southwest Forest Industries  
Standard Oil Company of California  
Shell Oil Company  
Talley Industries  
Texaco, Inc.  
Trammell Crow Company  
Del E. Webb Corporation  
Westinghouse Electric Corporation

Arizona State Retirement System  
Arizona Department of Transportation  
Arizona Parklands Foundation  
Arizona Department of Administration  
Department of the Army, Los Angeles District,  
Corps of Engineers  
Federal Bureau of Investigation  
Federal Deposit Insurance Corp.  
Federal Home Loan Bank Board  
Federal Savings & Loan Insurance Corp.  
General Services Administration  
Internal Revenue Service  
Resolution Trust Corporation  
USDA, Forest Service  
US Postal Service