

**MIDDLE NEW RIVER WATERCOURSE  
MASTER PLAN**

**Habitat Mitigation Plan**



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**MIDDLE NEW RIVER WATERCOURSE  
MASTER PLAN**

**Habitat Mitigation Plan**

Prepared for

**City of Glendale**  
Engineering Department  
5850 W. Glendale Avenue  
Glendale, Arizona 85301

and

**City of Peoria**  
Public Works/Engineering Administration  
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October 2001

## TABLE OF CONTENTS

	<u>page</u>
1.0 INTRODUCTION.....	1
2.0 PROJECT DESCRIPTION.....	3
2.1 Location.....	3
2.2 Project Summary.....	3
2.3 Responsible Parties.....	8
2.4 Impacted Jurisdictional Areas.....	8
2.4.1 Acreage.....	8
2.4.2 Type.....	8
2.4.3 Functions and Values.....	9
3.0 MITIGATION PLAN.....	11
3.1 Proposed Mitigation Areas.....	11
3.1.1 Existing Conditions.....	11
3.1.2 Proposed Uses.....	12
3.1.3 Target Functions and Values.....	13
3.2 Implementation Plan and Schedule.....	14
3.2.1 Glendale Mitigation Site.....	14
3.2.2 Peoria Mitigation Site.....	15
3.3 Site Preparation and Irrigation Plan.....	15
3.3.1 Glendale Mitigation Site.....	15
3.3.2 Peoria Mitigation Site.....	15
3.4 Maintenance.....	16
3.4.1 Glendale Mitigation Site.....	16
3.4.2 Peoria Mitigation Site.....	16
4.0 MONITORING PLAN.....	17
4.1 Success Criteria.....	17
4.1.1 Glendale Mitigation Site.....	17
4.1.2 Peoria Mitigation Site.....	17
4.2 Monitoring.....	17
4.2.1 Glendale Mitigation Site.....	17
4.2.2 Peoria Mitigation Site.....	18
4.3 Completion of Restoration.....	19
4.3.1 Glendale Mitigation Site.....	19
4.3.2 Peoria Mitigation Site.....	19
5.0 REFERENCES.....	20

**FIGURES**

	<u>page</u>
Figure 1: Project Location Map.....	4
Figure 2: Glendale Mitigation Site Topographic Map.....	5
Figure 3: Peoria Mitigation Site Topographic Map.....	6

**TABLES**

	<u>page</u>
Table 1: Proposed Improvement Summary .....	7
Table 2: Proposed Mitigation Plantings .....	14

**APPENDICES**

Appendix A	Site Photographs
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## **1.0 INTRODUCTION**

The New River, from its confluence with Skunk Creek northward to the New River Dam, is subject to development pressure in response to population growth in the adjoining Cities of Glendale and Peoria. The Middle New River Watercourse Master Plan (MNRWMP) was developed under the direction of the Flood Control District of Maricopa County (FCDMC) to provide the Cities of Glendale and Peoria with a comprehensive program for the management of the New River and the adjoining land subject to development pressure and to fulfill the FCDMC's obligation to the U.S. Army Corps of Engineers to maintain the New River as a floodwater conveyance corridor downstream of the New River Dam.

This habitat mitigation and monitoring plan has been prepared to address impacts to Jurisdictional Waters of the U.S. resulting from the modification, improvement, and maintenance of the channel and banks of the New River under the MNRWMP. Implementation of the MNRWMP will impact a total of 179 acres of waters of the U.S. Waters of the U.S. to be temporarily impacted will be 128 acres. Permanently impacted waters of the U.S. will total 51 acres. New Waters of the U.S. totaling 14 acres will be created by the improvements to occur under the MNRWMP. The total impacted acreage to be mitigated under the MNRWMP is 37 acres. The proposed mitigation will be the establishment and improvement with xero-riparian and desert upland vegetation of a site in the City of Glendale containing 11 acres and the preservation of a 31.25-acre site in the City of Peoria. The target function and value of the mitigation area will be the provision of habitat for native plants and wildlife.

Both sides of the New River are developed or significantly disturbed from the Skunk Creek confluence north to Pinnacle Peak Road. Types of development are residential, commercial, industrial, and agricultural. Disturbed undeveloped areas are characterized by evidence of previous grading and/or the presence of weedy, annual plant species. An overview of the project's biological resources,

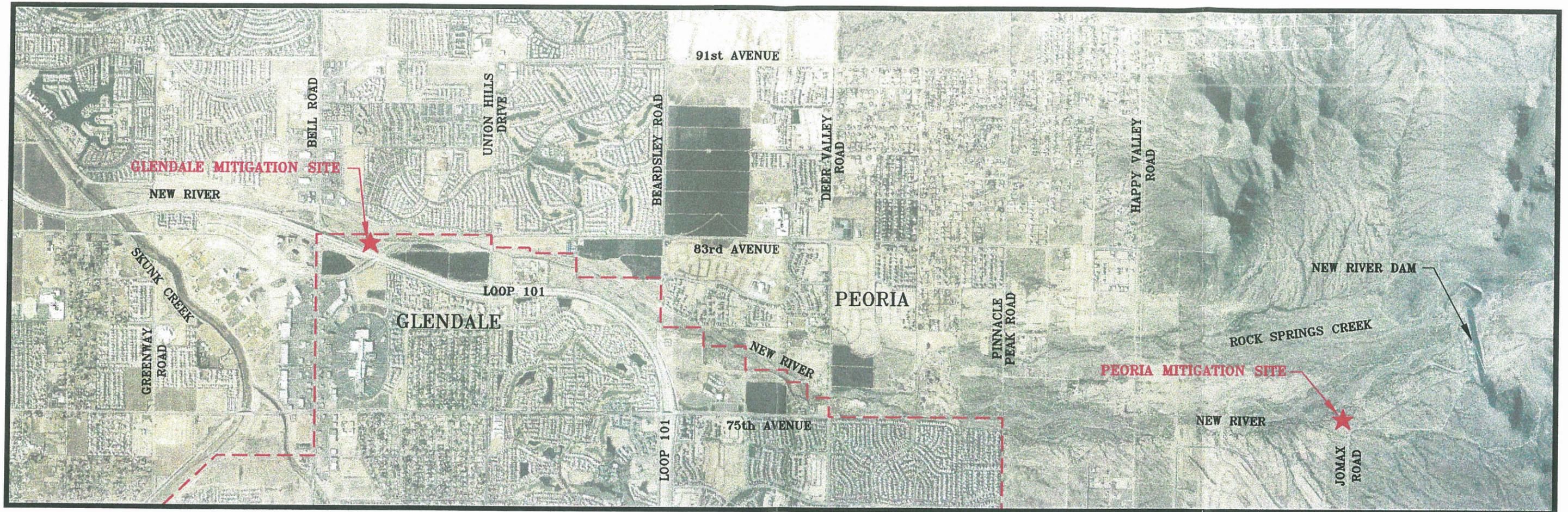
## **2.0 PROJECT DESCRIPTION**

### **2.1 Location**

The MNRWMP will impact the channel and banks of the New River from its confluence with Skunk Creek northward to the New River Dam. The length of the project is approximately 8.5 miles. Figure 1 shows the MNRWMP project location and mitigation sites with respect to Skunk Creek and the New River Dam. Figures 2 and 3 provide 1"=200' scale topographic mapping of the Glendale mitigation site and the Peoria mitigation site, respectively.

### **2.2 Project Summary**

The improvements proposed for the channel and banks of the New River involve grading and realignment of channel and banks, installation of rock-filled wire bank armor, installation of grade control structures, installation of river bottom access/maintenance ramps, and excavation of a pilot channel. Table 1 summarizes the improvements that will be necessary to implement the MNRWMP.



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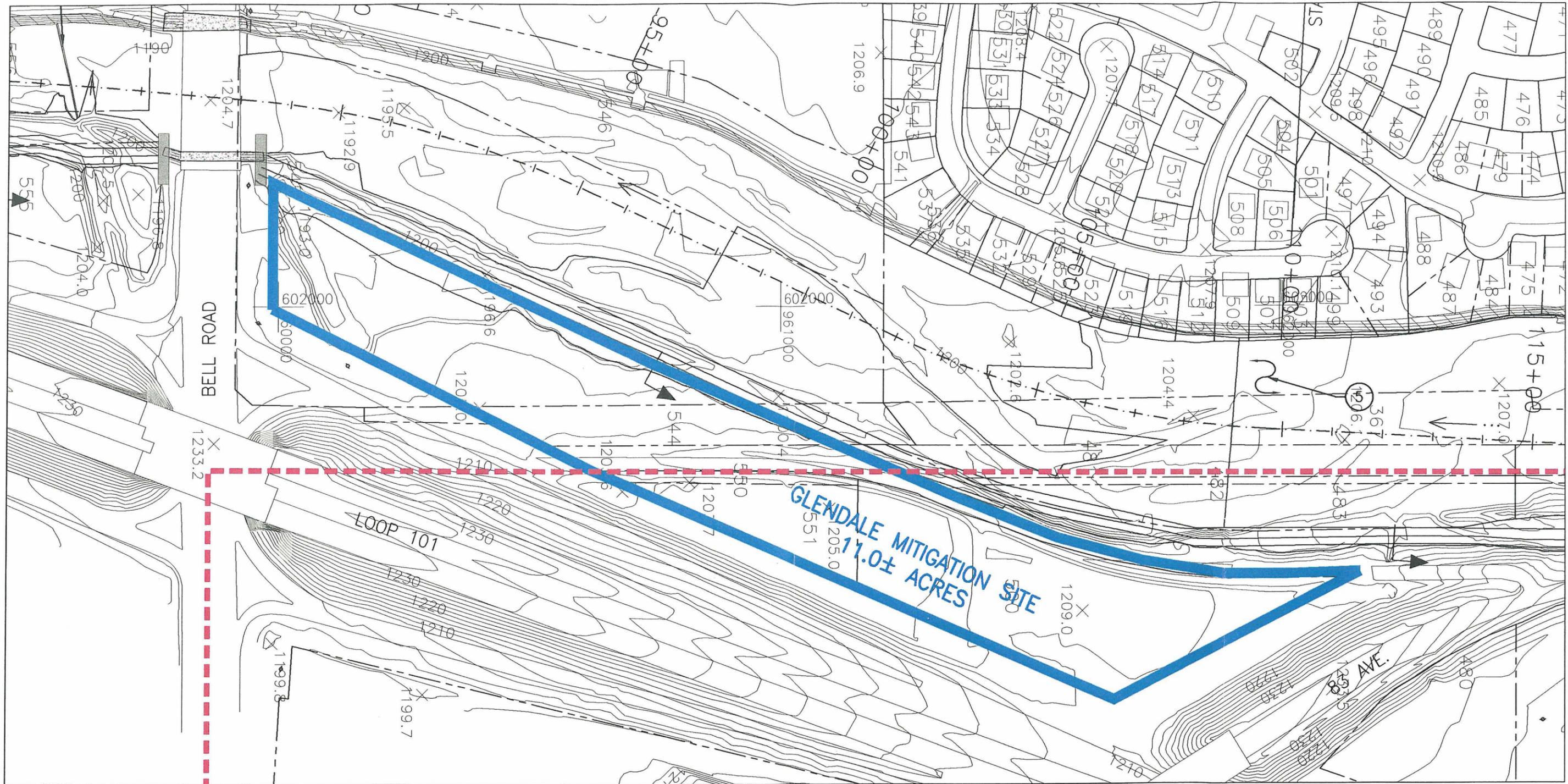
MIDDLE NEW RIVER WATERCOURSE  
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Figure No.

1

Title

PROJECT LOCATION MAP



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- CITY OF GLENDALE/PEORIA BOUNDARY
- MITIGATION SITE BOUNDARY
- EROSION SETBACK



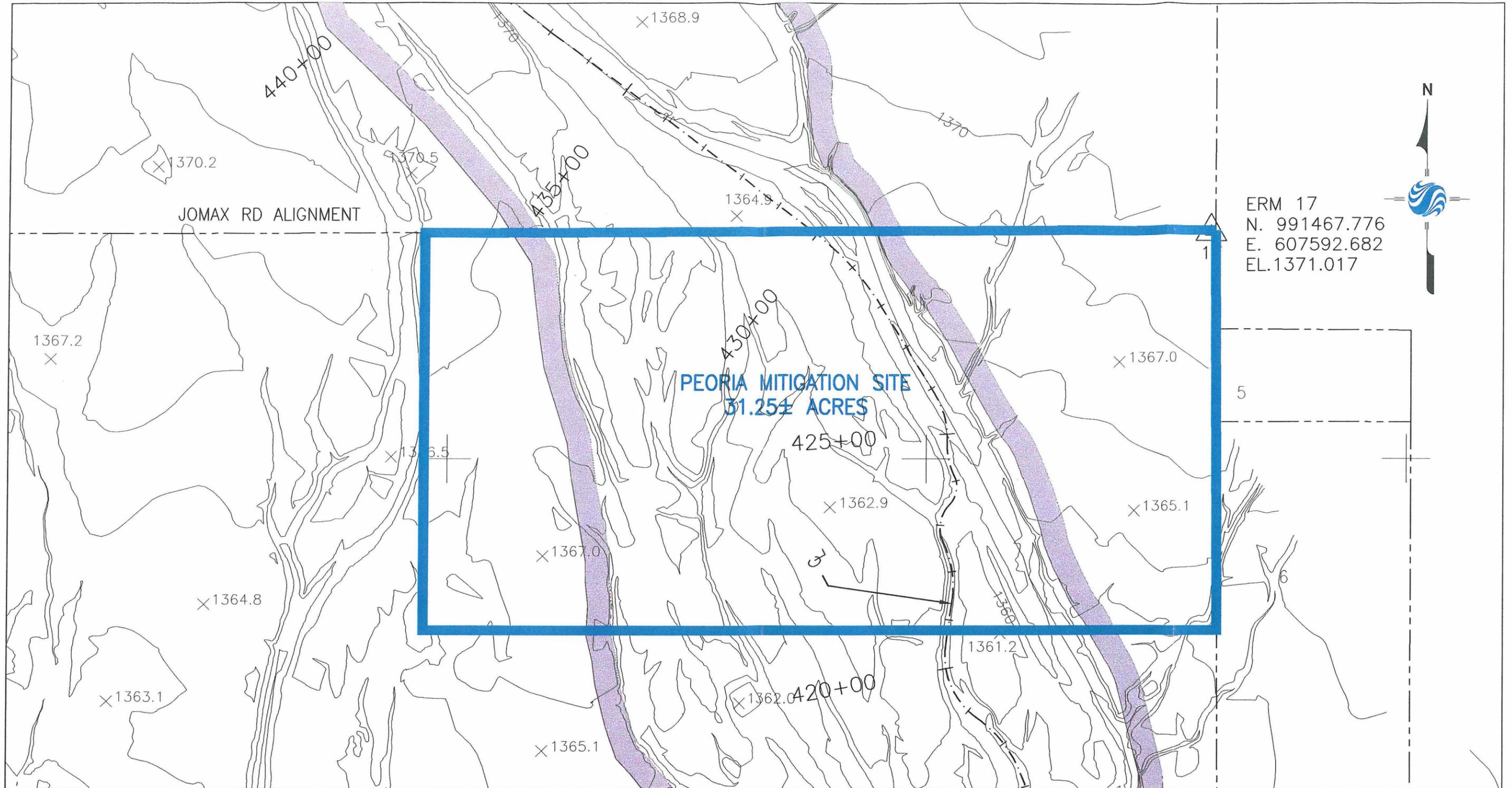
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Figure No. 2

Title  
**GLENDALE MITIGATION SITE  
TOPOGRAPHIC MAP**

Date: September 11, 2001  
Project Number: 82000192



ERM 17  
 N. 991467.776  
 E. 607592.682  
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- CITY OF GLENDALE/PEORIA BOUNDARY
- MITIGATION SITE BOUNDARY
- EROSION SETBACK



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 MIDDLE NEW RIVER WATERCOURSE  
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Figure No. **3**

Title  
**PEORIA MITIGATION SITE  
 TOPOGRAPHIC MAP**  
 Date: September 11, 2001  
 Project Number: 82000192

**Table 1: Proposed Improvement Summary**

Improvement Segment	Reach	Station (along construction line)	Proposed Improvements
1	1	26+30 to 55+00	Realign and grade east bank, provide rock-filled wire armoring. Minor earthwork within channel.
2	1	61+50 to 69+50	Realign and grade west bank, provide rock-filled wire armoring. Minor earthwork within channel.
3	1	78+50 to 86+50	Realign and grade east bank, provide rock-filled wire armoring. Minor earthwork within channel.
4	1	88+50 to 140+90	Realign and grade east bank, provide rock-filled wire armoring. Minor earthwork within channel from stations 88+50 to 109+00. Channel excavation from stations 109+00 to 133+00 and 136+00 to 140+90. Provide grade control structure and river bottom access/maintenance ramp at Station 133+00.
5	1	144+80 to 159+50	Realign and grade west bank, provide rock-filled wire armoring. Minor earthwork within channel.
6	1 & 2	159+50 to 314+00	Realign and grade east and west banks, provide rock-filled wire armoring, excavate channel. Provide grade control structure and river bottom access/maintenance ramp at Stations 258+18 (by others) and 311+00.
7	3	314+00 to 460+00	Erosion setback limits are utilized to define development limits. Installation of wing walls and collector channels at Station 315+00. Excavate pilot channel at Station 345+00 to Station 370+00, backfill and re-vegetate. Excavate pilot channel at Station 382+00 to Station 412+00, backfill and re-vegetate. Provide rock-filled wire armoring (east bank only) at Station 376+00 to Station 384+00.

### **2.3 Responsible Parties**

#### Mitigation Plan Preparation:

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### **2.4 Impacted Jurisdictional Areas**

#### 2.4.1 Acreage

The implementation of the MNRWMP will impact a total of 179 acres of waters of the U.S. Approximately 128 acres of waters of the U.S. will be temporarily impacted. Approximately 51 acres of waters of the U.S. will be permanently impacted. Approximately 14 acres of new U.S. waters will be created by the improvements to occur under the MNRWMP. Mitigation will be performed on 42.25 acres to offset the 37 net acres permanently impacted by the MNRWMP.

#### 2.4.2 Type

According to the biological resources overview prepared for the project, natural habitats within the project area are confined to the reach between the New River

Dam and Pinnacle Peak Road on the east bank and extend an additional half mile to the south on the west bank. The natural habitats are described as floodplain, terrace strand, and upland. The floodplain habitat occurs within the historic channel of the New River. The terrace strand habitat occupies the banks of the historic channel and extends to the limit of the 100-year floodplain. The upland habitat occupies the area outside of the limits of the 100-year flood.

The dominant vegetation species of the floodplain habitat, identified by the biological overview, are cheesebush (*Hymenoclea salsola*), burro brush (*H. monogyna*), desert broom (*Baccharis sarathroides*), sweet bush (*Bebbia juncea*), and bur-sage (*Ambrosia ambrosioides*). Several individuals of Gooding willow (*Salix gooddingii*) were identified within abandoned sand and gravel pits on the west bank immediately south of Deer Valley Road.

Dominant vegetation species in the terrace strand habitat identified by the biological overview are blue palo verde (*Cercidium floridum*), catclaw acacia (*Acacia greggii*), desert ironwood (*Olneya tesota*), and wolfberry (*Lycium spp.*). Honey mesquite (*Prosopis glandulosa*) occurs as widely scattered individuals in the area immediately downstream of the New River Dam.

In the upland habitat, creosote bush (*Larrea tridentata*) occupies the flats and grades into mixed creosote bush – bur-sage (*Ambrosia deltoidea*) assemblage at the northern end of the project area.

#### 2.4.3 Functions and Values

The primary function and value of the jurisdictional area to be disturbed is floodway for the conveyance of storm water run-off. The purpose of the Middle New River Watercourse Management Plan is the protection and promotion of the New River channel for this purpose.

The function and value of the New River channel for native plants and wildlife habitat is secondary. The New River channel below Pinnacle Peak Road contains low quality wildlife habitat and serves mostly as a migration corridor

linking the upper, undeveloped reaches of the New River to the Agua Fria River and the Salt and Gila Rivers downstream. Above Pinnacle Peak Road the Middle New River Watercourse Management Plan will preserve, to the extent feasible and consistent with the maintenance of the New River channel as a storm water floodway, the native plant and wildlife habitat functions and values of the jurisdictional area. Some disturbance of this area, however, will be required and this disturbance will be confined primarily within the channel and banks. It will be necessary to excavate a pilot channel and short lengths of bank armor will be installed at critical locations. These disturbances will affect the floodplain and terrace strand habitats.

### **3.0 MITIGATION PLAN**

Of the 179 acres of waters of the U.S. that will be disturbed by the improvements proposed under the MNRWMP, approximately 128 acres of disturbance will be temporary. The temporary disturbances will be mitigated by recontouring and revegetation by hydro seeding of native plant species at the sites of disturbance.

The permanent disturbance of waters of the U.S., totaling 37 net acres, will be mitigated at specified locations adjoining the New River channel and banks within the City Limits of Glendale and Peoria.

#### **3.1 Proposed Mitigation Areas**

The Cities of Glendale and Peoria will each be responsible for mitigation sites approximating the areas of disturbance within their jurisdictional boundaries of the Middle New River Watercourse Master Plan. The City of Glendale will conduct mitigation on an 11-acre site bordering the New River north of Bell Road. The City of Peoria will conduct mitigation on a site containing approximately 31.25 acres within and adjacent to the New River south of Jomax Road.

##### **3.1.1 Existing Conditions**

The proposed locations for the performance of habitat mitigation required by the Section 404 permit were visited by a representative of Stantec Consulting Inc. accompanied by Mr. Tim Wade of the Arizona Department of Game and Fish on 22 August 2001. Photographs contained in Appendix A show existing conditions at each of the proposed mitigation sites as observed on 22 August 2001.

##### **3.1.1.1 Glendale Mitigation Site**

The site proposed for mitigation by the City of Glendale is located on the east bank of the New River north of Bell Road and west of SR 101. Its north end is bounded by the 83<sup>rd</sup> Avenue ROW. The site is elongate, measuring approximately 250 feet in width and 2000 feet in length. The surface of the site is moderately rolling. It contains the asphalt-paved remnant of 83<sup>rd</sup> Avenue along the New River that was abandoned when SR 101 was constructed. It is currently

the site of landfill activity. Waste soil and construction debris is being dumped in a depression at the north end of the site. It will be necessary to demolish and remove the asphalt paving of the abandoned portion of 83<sup>rd</sup> Avenue that passes through the site and re-contour the area that is currently serving as a construction landfill before planting the site. It will be necessary to tap into a municipal water source to provide irrigation water for this site.

#### 3.1.1.2 Peoria Mitigation Site

The site proposed for mitigation by the City of Peoria occupies the channel and both banks of the New River in the NE/4 of Section 2, T4N-R1E. The site is bounded on its north by the Jomax Road alignment and on its east by the TerraMar planned community development. Section 2 is owned by the Arizona State Trust and is managed by the Arizona State Land Department. The Peoria site is readily accessible from the Jomax Road alignment and from the channel of the New River. The site is subject to significant surface disturbance caused by off-road motorcycles, ATV's, and recreational 4-wheel drive vehicles. The site has been subject to littering resulting from these activities and the abandonment of automobile chassis and parts. Although the site has been grazed in the past, vegetative cover on the site is approaching climax conditions.

### 3.1.2 Proposed Uses

#### 3.1.2.1 Glendale Mitigation Site

The proposed use of the Glendale mitigation site will be natural buffer between the New River channel and the SR 101 freeway east of the New River. Within the area where the mitigation will take place, plantings will consist of vegetation native to Arizona and the southwest. Initially, the mitigation plantings will be irrigated. When the plantings are sufficiently established, irrigation will cease and vegetation will be permitted to develop and remain in its natural condition. There will be no pruning of trees or cutting of brush planted for mitigation purposes. The area will be permitted to reach its maximum potential for wildlife habitat.

### *3.1.2.1 Peoria Mitigation Site*

The proposed uses of the Peoria mitigation site will be wildlife habitat, wildlife viewing, and natural buffer between the New River channel and the TerraMar development on the east and land eligible for development on the west. Parcels on both sides of the river will be securely fenced to prevent incursion by off-road vehicles. It will not be possible to fence the portion of the mitigation area occupied by the New River channel. The Peoria mitigation area will not be planted and irrigated. It is area determined to be threatened with destruction by encroaching development if not protected and preserved. Protection and preservation of the area will permit existing native vegetation and habitat to mature and improve naturally.

### *3.1.3 Target Functions and Values*

The target function and value of the Glendale and Peoria mitigation areas will be the creation and preservation of large areas of high-quality native plant and wildlife habitat incorporating the floodplain, terrace strand, and upland habitats in continuity. These areas will be maintained in a natural state as buffers preventing additional development and encroachment upon the channel and banks of the New River.

In the Peoria mitigation area, it is anticipated that the natural processes may result in erosion of the unprotected banks in this reach of the New River that will lead to modifications of the habitat mix. If the river threatens to escape the natural buffer, it will be necessary to restore it to its original channel and this may involve some disturbance of the proposed mitigation area. However, the mitigation area will remain undeveloped and its extent will protect the channel from encroachment by residential or commercial uses.

### 3.2 Implementation Plan and Schedule

#### 3.2.1 Glendale Mitigation Site

The 11-acre Glendale mitigation site (Figure 2) will be planted with trees, shrubs, and grasses that are native to the area and the habitats of the mitigation site. Sources of plant materials will be stock salvaged from disturbed areas in the New River, nursery stock, and native seed mixes. Table 2 is a listing of plant species and quantities to be planted. The quantity of plants in Table 2 indicates the number of plants needed to achieve an 80% survival rate for plantings. Revegetation of the mitigation area will be completed within 48 months of commencement of disturbance activities.

**Table 2: Proposed Mitigation Plantings**

Species	Current Density	Planting Density at 80% Success	Number to be Planted
Mesquite (western honey, screwbean, velvet)	< 1 per acre	9 per acre	124
Palo Verde (blue and yellow)	< 1 per acre	6 per acre	83
Acacia (catclaw)	< 1 per acre	3 per acre	41
Ironwood	< 1 per acre	3 per acre	41

A seed mixture of native brush and grass species will be applied to soil areas disturbed by re-contouring prior to planting of trees. The mixture and rate of seed application will be determined by the Arizona Game and Fish Department.

Irrigation of the mitigation site will commence with the first planting and will continue for a minimum period of three years following the completion of planting. Monitoring of the mitigation site will begin with the first planting and continue throughout the irrigation stage and for a minimum period of two years following the cessation of irrigation. The determination of the planting's success will be made during the two-year monitoring period following irrigation termination. If necessary, additional planting will be conducted to achieve 80 per cent survival of all mitigation species planted.

### 3.2.2 Peoria Mitigation Site

The State Trust land occupied by the proposed 31.25-acre Peoria mitigation site (Figure 3) will be acquired by the City of Peoria within 48 months of commencement of disturbance activities. Upon acquisition, the portion of the site occupying the banks and floodplain of the New River will be fenced by the City of Peoria to prevent further disturbance of the area by off-road vehicle enthusiasts. It will not be possible to fence the portion of the Peoria mitigation site occupying the New River channel. There will be no planting on the Peoria mitigation site.

## **3.3 Site Preparation and Irrigation Plan**

### 3.3.1 Glendale Mitigation Site

Where necessary, the Glendale mitigation site will be graded to re-establish natural contours and drainage. The hummocks of the current soil landfill will be leveled. The asphalt surface of abandoned 83<sup>rd</sup> Avenue will be demolished and removed from the site. There will be no vegetation removal at the Glendale mitigation site except as necessary for the re-contouring. Trees will be randomly planted to approximate natural distribution of species across the mitigation site. The plantings will be irrigated by temporary aboveground irrigation lines with emitters for each plant. Irrigation will be conducted for a minimum period of three years to aid and foster the plantings and to maintain them in their early establishment period. Monitoring of the mitigation plantings will continue two years beyond the termination of irrigation, during which time the success of the plantings will be assessed. Additional planting will be conducted, if necessary, to replace dead plant material and achieve the eighty percent survival criterion for mitigation planting.

### 3.3.2 Peoria Mitigation Site

The Peoria site will be fenced, on both sides of the New River, to prevent disturbance of the existing vegetation by off-road vehicle use. There are no plans to supplement the existing vegetation on the site with additional plantings

or irrigation. The protection of the existing vegetation from disturbance will permit it to mature to climax condition.

### **3.4 Maintenance**

#### **3.4.1 Glendale Mitigation Site**

Maintenance of the irrigation system and the plantings on the Glendale mitigation site will be conducted at times and intervals sufficient to ensure survival and sustain the growth of the plantings. The maintenance will include inspection and replacement, if necessary, of plantings in addition to inspection, maintenance, repair, and replacement of irrigation equipment. In order to support natural development of wildlife habitat within the mitigation area, no pruning of vegetation will occur except as necessary for the health of the plantings.

#### **3.4.2 Peoria Mitigation Site**

Maintenance at the Peoria mitigation site will consist of periodic inspection of the fences to determine that they are intact and preventing unauthorized access to the mitigation site.

## **4.0 MONITORING PLAN**

### **4.1 Success Criteria**

#### 4.1.1 Glendale Mitigation Site

The success criteria will be 80 percent survival of trees and larger shrubs. The survival rate will be confirmed by a plant census to be conducted two years after cessation of temporary irrigation. The time lapse between the cessation of irrigation and survival confirmation will permit an accurate evaluation of actual plant acclimation and establishment.

#### 4.1.2 Peoria Mitigation Site

Success at the Peoria mitigation site will be determined by the effectiveness of the proposed fence in the prevention of use of the mitigation site by off-road vehicle enthusiasts and other unauthorized uses that tend to result in the destruction of native plants and wildlife habitat. If initial experience shows the fence and periodic monitoring to be ineffective, the fence will be up-graded and monitoring increased.

### **4.2 Monitoring**

#### 4.2.1 Glendale Mitigation Site

Monitoring of the Glendale mitigation site will be conducted annually until the success criteria have been met. Permanent photo points will be established in the mitigation area and a field inspection will be completed after initial planting to determine as-planted conditions. In subsequent years, field evaluations and censuses will be utilized to assess survival, propagation, and success of the planting effort.

Monitoring reports will be prepared and submitted to the Corps of Engineers annually for review. Monitoring reports will contain the following information:

- Description of as-planted and as-built conditions (first year only)

- Names and addresses of persons and/or companies conducting monitoring activities
- Results of monitoring effort, including estimated survival
- Recommendations for additional plantings or other corrective measures
- Color copies of photos taken from permanent photo points
- Copies of field inspection forms and/or notes.

The first report will be submitted to the Corps of Engineers within 30 days of the completion of planting. The first report will be a baseline report that documents as-built and as-planted conditions. Subsequent reports will be submitted on an annual basis within 30 days of the anniversary of the submittal of the first report.

#### 4.2.2 Peoria Mitigation Site

The fences at the Peoria mitigation site will be inspected monthly to determine that they are successful at preventing incursion into the site by off-road vehicles. Permanent photo points will be established in the mitigation area and a field inspection will be completed after initial fence construction to determine as-built conditions. Monitoring reports will be prepared and submitted to the Corps of Engineers on an annual basis. The first report will be submitted to the Corps of Engineers within 30 days of completion of the fencing of the Peoria mitigation site. Annual reports will be submitted to the Corps of Engineers. Annual reports to the Corps of Engineers will contain:

- Description of as-built conditions (first year only)
- Names and addresses of persons and/or companies conducting monitoring activities
- Results of monitoring effort
- Recommendations for additional corrective measures, if necessary

- Color copies of photos taken from permanent photo points
- Copies of field inspection forms and/or notes.

### **4.3 Completion of Restoration**

#### 4.3.1 Glendale Mitigation Site

Notification will be made to the Corps of Engineers when the success criteria for the Glendale mitigation site have been satisfied and maintained for a period of two years following cessation of irrigation. The notification will be made in writing and it will accompany the final annual monitoring report.

#### 4.3.2 Peoria Mitigation Site

The goal at the Peoria mitigation site is preservation and disturbance prevention rather than restoration of habitat. Therefore, there will not be a specific point in time at which monitoring of the site by the City of Peoria will cease. It will be the responsibility of the City of Peoria to continue to protect the habitat of its mitigation site from incursion and damage by unauthorized use. However, annual reporting to the Corps of Engineers may cease on the fifth anniversary of completion of the acquisition and fencing of the Peoria mitigation site by the City.

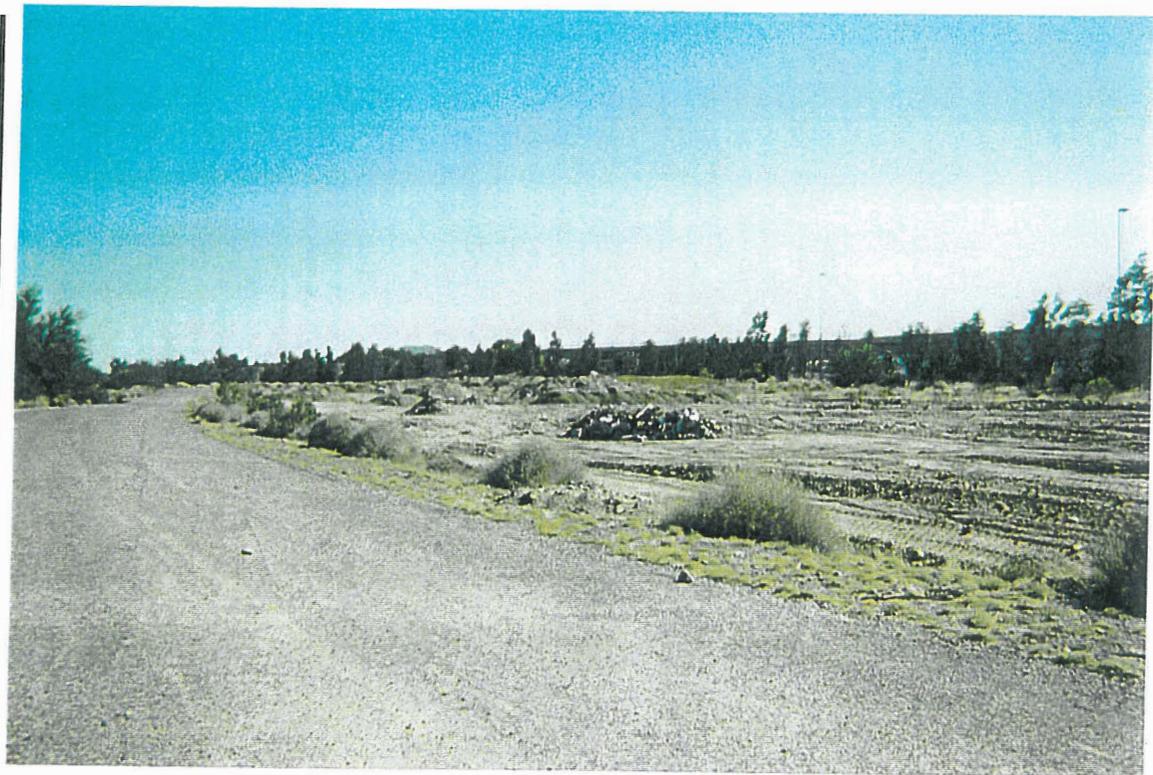
## 5.0 REFERENCES

1. Johnson, R.A., 1999, *Overview of Biological Resources in the Middle New River Watercourse (confluence with Skunk Creek to New River Dam)*, Johnson & Assocs., EEI, Inc., Tempe, Arizona.
2. *Middle New River Watercourse Master Plan*, June 1999, revised May 2000, Stantec Consulting Inc., Phoenix, Arizona.

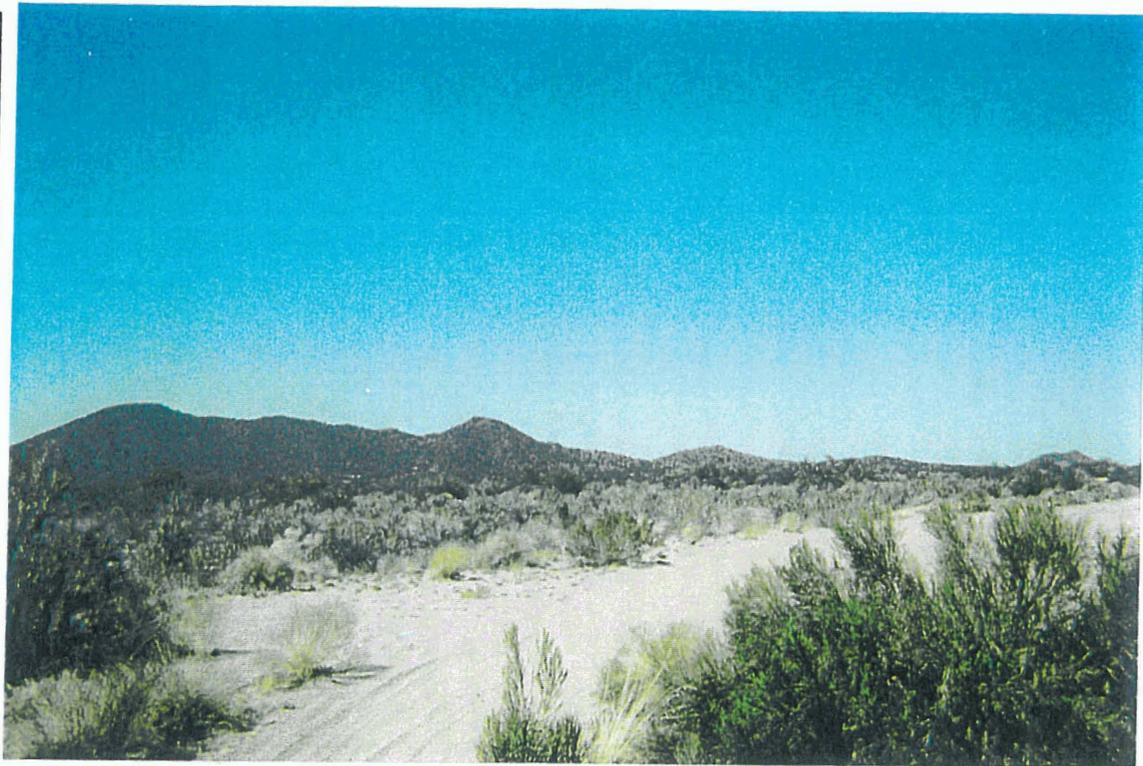
**APPENDIX A**  
**SITE PHOTOGRAPHS**



**Photo 1:** View north from south end of Glendale mitigation site.



**Photo 2:** View northeast of landfill and abandoned 83<sup>rd</sup> Ave. alignment in Glendale mitigation site.



**Photo 3:** View west of the Peoria mitigation area from the Jomax Road alignment on the east bank of the New River.



**Photo 4:** View southwest of the Peoria mitigation area from the Jomax Road alignment on the east bank of the New River.



**Photo 5:** View southeast of the Peoria mitigation area from the Jomax Road alignment on the east bank of the New River.